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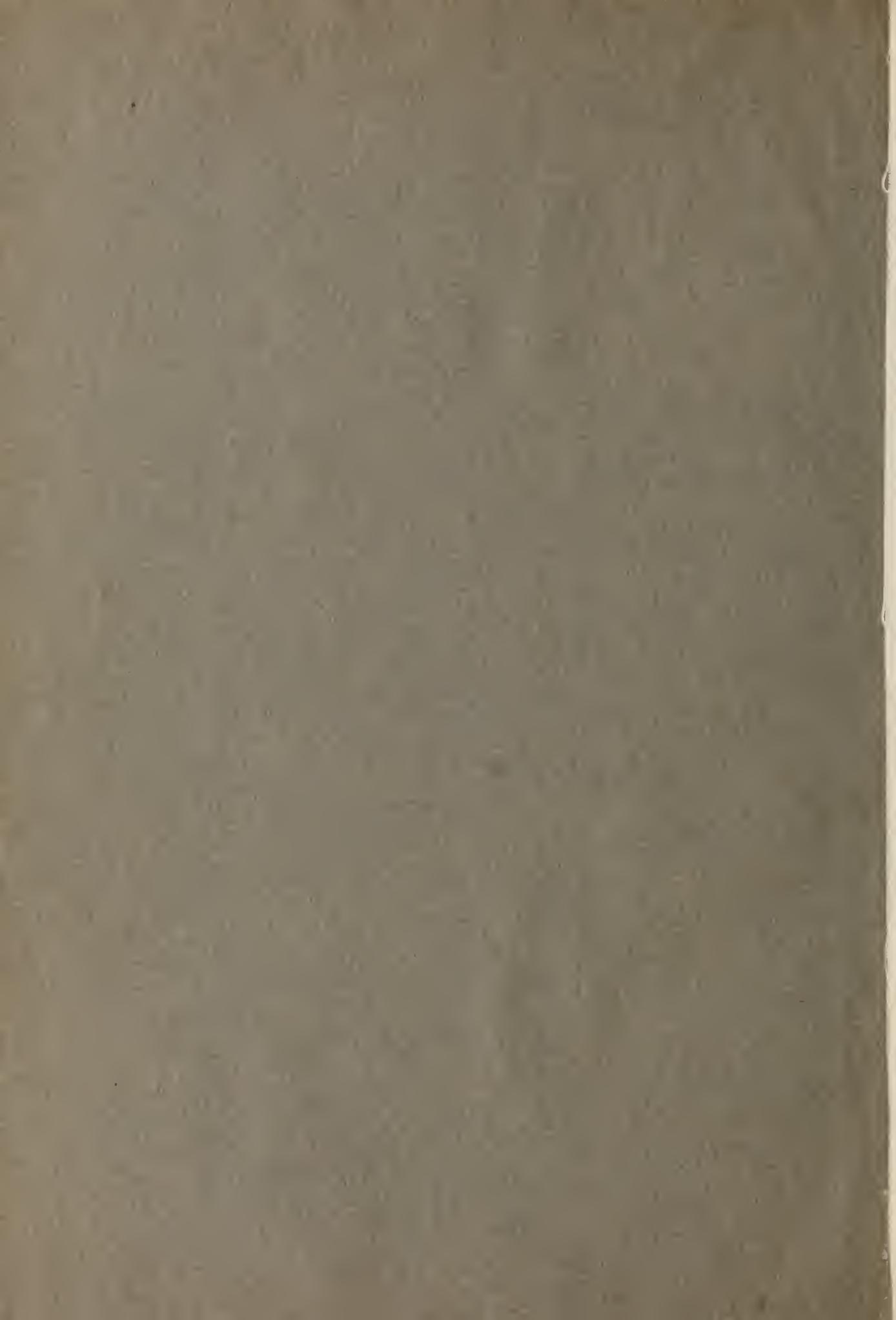
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Cooperation in Endocrinology as an Introduction to Research on the Morphological Constitution

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The editors of an American (1) medical publication recently made a statement as to organized versus individual effort in research. They said, *inter alia*, "It is doubtless true that two heads are better than one. But in our modern enthusiasm for organization we are in danger of forgetting that system and survey and encyclopedic knowledge can never supplant real thinking. Thinking is, after all, an individual performance." And later on, "A league of investigators might promote lasting benefits to the world. No one would expect it to make a scientific discovery. . . . We need not be blind to the integration in science; we must not be forgetful of the man. Genius is found in men, not in organizations."

This seems to me well put and in the main correct. I should have explicitly stated the same thing, meaning that I by no means underestimate the value of individual work and still less aim at replacing it by cooperation in the departments of endocrinology in which individual effort has already achieved such valuable scientific results, while at the same time I shall try here to call attention to certain other departments of endocrinology which are not only suitable for cooperative methods of work but, as far as I can see, can only be made accessible to science in this way.

To connect my remarks directly with what was said above with regard to scientific discoveries I may remind the reader that there are departments in science that have been for a long time so thoroughly investigated and so carefully mapped out that the prospects of making new discoveries of importance within them are not particularly great. Human anatomy is one of these departments. It is true that we can point to a case, such as Sandström's discovery of the parathyroids, published as late as 1880, thus of an organ whose vital character was shown later on, as a proof that even here a penetrating investigator can make discoveries of far-reaching importance. But we must admit that, on the whole, research work directed towards making real discoveries in this field does not seem particularly promising. And the opinion is accordingly sometimes expressed that especially gross

human morphology is a finished chapter of biology which is of greater importance nowadays as a subject of teaching than as a field of research.

I believe, however, that this point of view is not correct. It seems to start out from the assumption that the essentially analytical method of work that has hitherto been characteristic for anatomy is the only possible and correct one. It is certainly true that a separation of the body into its different components is to a certain extent so much a part of the nature of anatomy that a program of this sort may be said to be denoted by the very name of this science. It is unnecessary to express any opinion here as to the possibilities of penetrating in this analysis far beyond the point we have reached at present. In many respects the continuation of morphological analysis depends on the development of histological technic, the extension of the world observable by the microscope, and the creation of new guarantees against the confusion of preformed structure and artefacts.

It is certain that, however justified and indispensable this analytical tendency in anatomy may be, it implies a certain risk for this science as a branch of medicine and biology, namely of overlooking or neglecting the whole because of the multitude of details. There is much, however, to indicate that the time has now arrived when a synthetic direction in anatomy, taking the human organism as a unit—constitutional anatomy, if a short term is desired—may and ought to come into its own.

It is not my intention here to enter in detail into the question of what aims are to be set up in constitutional research of this sort in anatomy and what are the most suitable means at our disposal for such research. Some years ago, in a paper (2) on this question, I tried to lay down some lines of advance for it. I will only point out here that the most important condition for a synthetic tendency of this sort in anatomy is an accurate analysis, carried out according to a numerical method, of a sufficiently comprehensive and in the strictest sense normal anatomical material. I shall illustrate immediately in a more concrete way what is meant by this. But

before doing so I merely wish to point out that from this point of view human anatomy, so far from being a science that is practically complete, must rather be said to be faced with an enormous task, at present scarcely started. Not until this task is accomplished will this science be in a position to fulfill the demands made upon it by medicine, and this work can only be carried out by cooperation.

It is not improbable that the differences that appear in different individuals of the same species and that we summarize under the heading different individual constitutions, are both of a qualitative and quantitative nature. If, however, we pay attention only to such individual peculiarities as are accessible for morphological investigation, it seems as if it is only in exceptional cases that we are concerned with qualitative differences; as a rule, the variations seem to be quantitative. If, in addition, it is true—one may very well say obvious—that really scientific research on constitution cannot and ought not to do without a proper anatomical foundation, then it follows that a quantitative analysis of the different organs of the body is a fundamental condition for all scientific investigation on constitution.

For this purpose it is necessary in the first place to establish the normal range of variation so as in this way to be able to state what is normal numerically and what is pathological. Average values, with which investigators have generally been satisfied formerly, are of little importance in this respect.

Nor is it sufficient merely to establish the size of the organ—its weight. To attain a real insight into the conditions of the separate organ for the present purpose we need the most thorough morphological—numerical—analysis of it with regard to its various structural regions, if possible, right to the cellular units.

And, moreover, it must not be forgotten that the constitution is a factor that is present before and to a certain extent independent of all disease. Under these circumstances it is not in accord with sound scientific method to try to investigate constitutional conditions on the basis of cases that are complicated by disease. It is generally admitted that organs directly affected by morbid changes are not suitable as a basis for establishing the normal conditions of size and structure. On the other hand, less attention has been paid to the fact that even apparently uninjured organs belonging to persons attacked by disease are not suitable for this purpose either. As a rule, organs of this sort have been used to a great extent in working out hitherto accepted norms with regard to the conditions of size, etc., in the human organs. At most, direct lesions of the organs have been avoided in this; the indirect disturbances undergone by the organ in its capacity of a component in an organism attacked by disease have been unnoticed. Only the relatively rare cases in which a person in perfect health dies from external violence or similar causes are thus available for constitutional research in normal human anatomy.

Finally, it must not be forgotten that by establishing the range of variation in the separate organs and components of organs in a material of a nature

corresponding to the increased demands indicated here and adequate in amount for this purpose, the requirements of constitutional anatomy are by no means satisfied. Just as it is certain that all constitutional investigation is directed towards the individual considered as a unit and not the conditions of the separate organ, it is equally certain that only by paying attention to the correlation existing between the different organs or components of organs, respectively, investigated in this way in the same individual, that such investigation will come within the range of constitutional research.

Anatomical investigation does not of course afford direct information as to the functional correlation; this can at most be merely assumed on the basis of anatomical data; and to establish it science has at its disposal methods other than those offered by morphological work. But what morphology can and must establish is the correlative variability in organs and components of organs and with this the individual morphological type. The importance of this type of investigation for the race problem need only be briefly mentioned here.

For the investigation of correlative variability as for all objective comparison of biological data, the exposition in an exact numerical form of the experiences gained is an indispensable condition. From this arises the demand expressed above for numerical methods of research.

These indications ought to be enough to show that when, as must happen sooner or later, morphological investigation once sets to work on the great problem of constitution, it will have so large a field of work that what has so far been done in this department will seem but a preparation. It is also obvious that an investigation of this sort demands both so great an expenditure of time and such great systematization and uniformity of method that—to repeat what I have previously said—its accomplishment without cooperation seems inconceivable.

Nor can a program of this sort be realized except step by step. It is not only that the widening of the problems cannot be expected to take place to any great extent before the work is in progress, but the whole field of work can scarcely be submitted to investigation at once either. If there are any departments in which the need of investigation on these lines is more urgent than elsewhere it is certainly the nervous system and the endocrine system, nervous and humoral correlation being, as far as our present knowledge extends, the two ways in which coordination and cooperation between the different parts of the organism take place. Under these circumstances it is not strange if it is just these departments that promise the most abundant results from a method of working of the sort put forward here.

I shall not enter here upon the question of the investigation of the nervous system on these lines. There are indications that of late neurologists have realized more and more the importance of numerical methods in their field of work.

I can also be quite brief as to the closer application of these views to the endocrine system. I have discussed this side of the question at some detail

recently (3) and I may briefly quote something from this account to throw light on the question.

I tried in that article to show that at every disturbance of an endocrine organ, other endocrine organs too must be affected and that in other diseases these organs are probably also concerned, without its being for the present in our power to determine either the participant organs themselves or the degree to which they have been affected. To remedy this state of affairs we must, as I also pointed out, elaborate for every endocrine organ special methods, which admit of a numerical determination, with sufficient accuracy, of the material components of the organ.

These methods must in the first place be applied to a sufficiently comprehensive human material of endocrine organs. This must be normal in the strict sense indicated above if we are to attain a really wellfounded insight as to the normal range of variation; it cannot be collected except by joint efforts.

By following the attained norms we shall then be able to decide whether a value from a case of disease falls within or outside the range of the normal and in what direction an eventual displacement has occurred.

"Every organ has no doubt in this respect its own peculiar problems, a complete view of which can be obtained only by very close attention to the subject. Some of these problems, however, are so obvious that they may be indicated without further investigation.

"Thus, for instance, in the hypophysis, with accurate elimination of the connective tissue, the amount of each of the three principal portions ought to be ascertained. In the anterior portion the number of the different cell types, in the intermediate portion the number and size of the cysts with and without colloid should be approximately settled.

"In the thyroid the weight of the true parenchyma similarly with deduction of the bulk of the connective tissue is to be ascertained; again, in the parenchyma the amounts of the trabecular and adenomatous territories, respectively, should be fixed apart from the acinar portion; and in the last mentioned part the number and size of acini with and without colloid should be calculated.

"Similarly, in the parathyroid glands the true parenchyma, the trabecular and cystic tissue should be treated separately. Here, moreover, we meet with the task of approximating the relative and absolute numbers of the acidophil granulated cells.

"With regard to the pancreas, the next object should be to ascertain the quantity of the endocrine and the exocrine parenchyma, as well as to calculate the number and size of the islets of Langerhans.

"In the adrenals the quantity of the cortex and the medulla, as well as of the different zones of the cortex, requires to be expressed numerically. Perhaps it will not prove quite impracticable with morphological methods to approximate the percentage of lipoids and adrenine in the organ, which would evidently be of the greatest consequence for estimating the state of function of an individual organ.

"Concerning the sex glands, it is of special importance to ascertain the amount of endocrine tissue, in doing which for the ovaries, the corpora lutea and the so-called lutein tissues should be considered separately. To settle the number and size of the ovarian follicles lies, as Valberg (4) has shown, within the bounds of possibility even in the case of a relatively large material. To figure the state of the spermatogenesis with fair accuracy seems, at all events in the case of a human being, where the process passes on so irregularly, a difficult task; but it would, however, evidently be of great importance.

"In all these enumerations we cannot stop at apparent or relative values; the real and absolute amount of every element of tissue treated must be approximately fixed. We must not forget that a relative increase of a structural element is perfectly compatible with an absolute reduction, and vice versa."

This is briefly the program of work I put forward in the paper referred to. The organization necessary to carry it out may of course be conceived in quite different ways. To me it has seemed desirable that a central body with great authority and furnished with adequate material resources should on the one hand arrange for the appointment of the different groups of specialists who would have to work out and test suitable numerical methods for each of the endocrine organs, and on the other hand superintend the collection of the necessary material of organs and its distribution to the groups of working investigators. It is unnecessary, however, to deal at greater length with this here.

The chief purpose of these lines is merely an attempt to place the suggestion put forward in *Endocrinology* in the light of the problem of constitutional anatomical investigation in general. It seems to me exceedingly probable that sooner or later this type of research must make its way into anatomy. The sooner this is realized, the fewer obstacles in the shape of gradually accumulated incorrect ideas and conceptions will constitutional research as a whole have to overcome in the future.

It has been remarked with regard to cooperation in general in science that it puts a restraint on the valuable individual initiative. If, however, combinations of the sort suggested here are, as is of course assumed, quite voluntary, and proceed from a realization of the importance of the task and an interest in its accomplishment, I do not think that it will cause any inconveniences to be felt. We must of course not overlook the fact that this is a question of procuring primary scientific material the need of which is obvious, material which the individual investigator is then at liberty to make further use of for the needs of his own special researches. The nearest parallel to this undertaking would be a scientific voyage of exploration, where cooperation had also taken place because individual strength is insufficient to carry out the undertaking; there, too, the actual procuring of material may be of course the essential part of the common task.

One might also say that the idea of realizing a constitutional anatomy implies the relinquishing by morphology itself of some of its independence with

regard to other branches of biology. It has formerly been often strongly maintained that each science must work at its special questions and in that way best serve the whole. This may undoubtedly be justified as long as it is the question of a certain science taking entire possession of its special field. But once this has been done it would seem as if the separate biological departments must cooperate in solving the great questions common to the whole of biology. And in my opinion research on constitution, of which research on heredity forms only one, though very important, branch, and without which eugenics and racial investigation can never gain a proper scientific basis, has important

qualifications to form one day a common and unifying focus for the whole of biology. The practical importance of this question to medicine is so great that it seems to me to constitute a direct demand for it to take the lead in this matter.

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The Relation Between the Adrenal Cortex and Sexual Development

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In the majority of endocrinological manuals and extended articles on adrenal tumors a special relation is noted between the function of the adrenal cortex and the development of the sexual organs.

Neurath (26) (1909), in his monograph on precocious puberty considers ten cases of adrenal cortex tumor described in the literature as instances of precocity in that there was development of secondary sexual characteristics. Nevertheless he remarks that in none of the cases was there found any remarkable function of the genital glands such as menstruation or ejaculation. He concludes that from clinicoanatomical findings it would seem that there existed a functional connection between the adrenal glands and the development of the secondary sexual characteristics.

Glynn (14) writes (1912): "The adrenal cortex is especially connected with growth and sex characters; adrenal hypernephromata are associated with sex abnormalities, almost invariably in children, usually in adult females before the menopause, but apparently never in adult females after the menopause or in adult males. Premature development of female sex characters in females may occur with certain ovarian tumors and of male sex characters in males with certain tumors of the adrenal cortex."

Gallais (13) concludes in his thesis of 1912: "We know that in reality the genital glands and the adrenal cortex have a common embryological origin and that identical substances belonging to the group of lipoids have been found in the adrenal cortex and the ovary. It seems therefore that in view of their action in relation to the development of the sexual characteristics, the adrenal glands supplement the ovaries, but that in these cases the adrenal glands produce sexual phenomena ordinarily produced by the interstitial testicular gland."

Schäfer (32) (1913) mentions Glynn's considerations: "The occurrence of a connection between the development of the sexual organs and that of the suprarenal cortex has been especially insisted

upon by Glynn, who is of the opinion that the cortex is concerned with the differentiation and growth of the sexual cells."

Falta (10) (1913): "By development of such hyperfunctioning cortical (adrenal) tumors in children an enormously accelerated development of the body and a premature development of the genital organs takes place."

Wiesel (34) (1913), who describes the coincidence of adrenal tumors with *pubertas præcox* and virilism, is somewhat inclined to consider the "*syndrome génitosurrénal*," as Gallais has called it, as a pluriglandular disease and agrees with Gallais in considering the connection between the adrenals and ovaries as an expression of the common development from the mesothelium.

Biedl (2) (1916) writes: "In addition to these congenital abnormalities in which unilateral neoplasms, most frequently hypernephromata of the adrenals, are especially remarkable. These in childhood are associated with an early growth of the whole body, but especially of the sexual organs, with an abundant trichosis and considerable adiposity, or as a whole, with *pubertas præcox*."

Cobb (5) (1918) does not mention the relation of the adrenals to precocious puberty but suggests that tumors of the adrenal cortex have been found in cases where the characteristics of the opposite sex have developed.

Leiner (20) (1920) describes a special adrenal cortex type of *pubertas præcox*: "When there occurs hyperplasia of the adrenals in the male, it tends to accentuated masculine precocity. When it occurs in the female it tends to change the female into the male type and to give her the secondary sexual characteristics of the male."

Lipschütz (22) (1920) mentions: "In other rather numerous cases of sexual precocity tumors of the adrenals have been mentioned, both in boys and girls."

It will be seen that opinions on the relation between the adrenal cortex and sexual development

vary; but on the whole it is suggested that there is a connection, expressed by the development of precocious puberty, in cases of adrenal cortex tumors and adrenal hypertrophy in female pseudohermaphroditism. And many authors insist on the strange fact that this puberty in girls has the character of a male puberty.

In the literature seventeen cases of adrenal tumors have been described in which symptoms of what has been considered *pubertas præcox* have been found. Cookes (7) in 1756 described a girl aged seven years, who had hair on the face and cheeks. The clitoris was large. There had been no menstruation. She died and autopsy showed a tumor over the right kidney and below the liver. In addition there was acute hydrocephalus.

Tilesius (32) in 1803 published the history of a girl aged four years. She looked old, was enormously fat and had *mammæ* and pubic hair. The hair was long and thick on the extremities and on the body. Menstruation is not mentioned. Autopsy showed a tumor, probably an adrenal tumor. Ovaries and uterus were well developed for the age. Hydrocephalus was present.

Ogle (27) and Pitman (29) (separately) in 1865 each described the case of a girl aged three years, in whom hypertrichosis developed with marked adiposity. There was no evidence of any menstrual function. The autopsy showed an adrenal tumor. Uterus and ovaries were quite small and undeveloped.

Fox (12) in 1885 mentioned a girl aged two years who was extremely fat. The whole surface of her body was remarkably hairy, especially about the genital and pubic regions. No remark is made concerning menstruation. Postmortem examination showed vulva, labia and clitoris remarkably developed. The uterus and ovaries were large. On the left side there was a tumor, probably an adrenal tumor.

Dickinson (8) in the discussion after Fox's communication said that he had seen a suprarenal tumor in a boy aged three years. He had hypertrichosis and dark skin.

Orth (28) briefly communicates (1893) the history of a girl aged four and one half years, who at the age of nine months showed pubic hair and in the last year a beard also. External genital organs were highly developed, especially the clitoris, which was like a penis. Autopsy showed an adrenal tumor. (Menstruation is not mentioned.)

Dobbertin (9) published the following case in 1900: "A girl aged fourteen months had long dense hairs on both labia and on the lower abdominal region, the side of thorax, the back and the cheeks short soft hairs. Autopsy showed a tumor of the left adrenal.

Linser (21) described in 1903 a boy aged five and one half years. When he was four years old he grew very much and was remarkably hairy. The *mons veneris* was covered with curled hairs; penis eight to nine cm. long, testicles larger than pigeon's eggs; prostate large. His body looked like that of a fifteen year old lad. Autopsy showed no macroscopical thymus. There was a large tumor of the left adrenal. Testicles did not seem to function.

M. Miller (24) (quoted by Glynn) in 1903 described a case of tumor rising from the right suprarenal gland in a girl of two years. There was luxurious growth of pubic hair. The labia majora were hypertrophied, *minoræ* projected. The clitoris measured four cm. and the prepuce could be retracted. The ovaries were enlarged.

Adams (1) (1905) published the case of a boy aged fourteen years. Puberty set in at the age of ten years, after which although he increased but little in height, he developed great muscular strength. There was growth of hair on his face. Autopsy showed tumor of the left adrenal.

Bulloch and Sequeira (4) in 1905 published the case of a girl aged eleven years who was very large. Menstruation began fifteen months previously, when she became very fat, very hairy on cheeks and lips. The *mammæ* were large, there were long axillary and pubic hairs, cyanosis and edemata. On autopsy a tumor was found connected with the left suprarenal body. Thyroid and parathyroid were hypertrophic; uterus enlarged, ovaries rather smaller than normal with fresh corpora lutea.

Ritchie gave the following communication to Bulloch and Sequeira: A girl aged four years died after osteotomy. The one suprarenal gland was the seat of a tumor (sarcoma). The sexual organs were as large as those of a developed woman. No history of menstruation, but there was an abundant development of pubic hair.

Richards (30) (1905) published the following case, communicated to him by Walker: A girl aged seven years was healthy up to the age of five years, then became very stout and a beard and pubic hair developed. Postmortem examination showed the left kidney the size of a cocoon, made up entirely of new growth. Pelvic organs healthy and normally developed for her age.

L. Guthrie and W. d'Este-Emerly (15) in 1907 described a boy aged four and three quarters years who was thirty-six inches high and for three years had had hair on face and pubes and was very obese. Autopsy showed a rounded tumor in contact with the upper and anterior surface of the kidney, possibly carcinoma. The testes contained no spermatozoa. There was no tumor of the pineal gland.

E. Glynn (14), who in 1912 wrote an important paper on the adrenal gland and sexual development, personally observed the following case: A girl aged five years became abnormally tall, fat and flabby, had a profuse growth of hair on the scalp, upper lip, pubes and back. She never menstruated. The uterus appeared to be of usual size, no hypertrophy of the clitoris or *mammæ*. Postmortem examination revealed an enormous tumor in the right lumbar region and the right suprarenal capsule could not be found. Ovaries and pituitary were normal.

Herbert French privately communicated to Glynn the following case of a girl in whom the pubic hair developed at the age of eighteen months. She was admitted to a hospital when seven years old with hypertrophic external genitals and a large swelling on the upper part of abdomen. Postmortem showed tumor of left adrenal.

Schiff (31) (1918) described a girl aged two

years with adiposity, hypertrichosis on the whole body and pubic hair, moderate beard, no axillary hairs. Chest normal; deep voice; face and neck very adipose. Genital organs were normal. Autopsy showed thymus thin and somewhat fibrous. Right adrenal gland modified to a tumor (hypernephroma). Hypophysis and pineal gland seemed slightly enlarged. Ovarian structure was normal.

Among these cases are those of four males (Dickinson, Linser, Adams and Guthrie and d'Este-Emery). Linser's case is a typical case of precocious puberty; the three other cases can probably be related to the syndrome, although the description is somewhat incomplete.

We must consider the cases in girls from a different point of view. Only in the case of Bulloch and Sequeira is it mentioned that menstruation has taken place, and in that case not before the age of ten years, the outside limit for the normal beginning of menstruation. In all the other cases menstruation is not mentioned or it has been stated to have been lacking. In describing the development of the ovaries in the Ogle-Pitman case the uterus and ovaries were said to be quite small and undeveloped. Orth mentions only the development of external genital organs. Dobbertin and French do not mention the ovaries. Richards says that the pelvic organs were normally developed for the age. Both Glynn and Schiff say that the ovarian structure is normal. Only in the case of Bulloch and Sequeira is it mentioned that corpora lutea were found.

It will be seen that these cases nearly all differ considerably from those which ordinarily have been described as cases of premature puberty. In the literature several cases have been described in which the sexual development in girls (menstruation, development of mamme and pubes) has begun in early childhood. But it is striking that in most of these cases there has been no hypertrichosis beside the pubic hairs. And in fourteen out of fifteen cases here mentioned of adrenal tumor there seems not to have been any menstruation. The difference is very important and most of the text book authors above mentioned have remarked on it without any attempt to explain it.

When we try to explain these phenomena we must first consider that the majority of cases of so-called precocious puberty in girls with adrenal tumors cannot be characterized as true *pubertas præcox*. The essential in *pubertas præcox* in girls is ovulation and menstruation and only one of these cases has shown these signs. But how can the development of pubic hair be explained?

At normal puberty axillary and pubic hair develops, but only a very few hairs on the limbs and body, although hair follicles exist. In other words, the hair follicles of the pubic region can produce more hairs than the other hair follicles. But what would happen if a generalized, pathologically abundant development of hairs, a hypertrichosis, appeared, in a child? Of course, the hypertrichosis would be most marked in the pubic region. That is the case in the above mentioned histories. In the cases of Tilesius, Fox, Dobbertin, Linser, Dickinson, Glynn and Schiff there has been a general hyper-

trichosis, in the cases of Cooke, Orth, Adams and Bulloch and Sequeira, hypertrichosis of the face. As in most of these cases we have no sign of true genital function, there is no reason to consider the development of pubic hairs as a special sexual sign, but only as a natural link in the hypertrichosis. It may be remarked that in cases in which general hypertrichosis is produced by injections of pituitrin the hypertrichosis is especially marked in the pubic region.

We will consider the development of *mammæ* in the case of Tilesius from the same point of view. The patient was extremely fat and it is commonly known that in very fat persons there is a tendency to fatty deposits in the mammary and pubic regions. In most of the other cases besides that of Bulloch and Sequeira no development of *mammæ* is mentioned, which is striking when it is considered that in the majority of the described cases of uncomplicated *pubertas præcox* in girls there have been well developed *mammæ*.

Furthermore, there are other features which must be regarded in connection with the hypertrichosis. In the histories of Fox, Orth, Miller and French the clitoris was large. In the history of Schiff the voice was deep. Generally speaking, neither the hypertrichosis nor the development of clitoris or change of voice can be considered as signs of precocious puberty in girls in whom menstruation has not appeared. Among the fifteen described cases of adrenal tumors in girls only the case of Bulloch and Sequeira can be considered as a case of *pubertas præcox*.

The symptom complex of hypertrichosis, clitoris hypertrophy and deep voice is so characteristic for the male sexual character that there is no doubt that Gallais, Glynn and Linser are correct in considering that syndrome as virilism. And this consideration is further supported by the fact, that female hermaphroditism (fetal virilism) coincides with adrenal hyperplasia (Marchand (23), Fibiger (11), Glynn (14) and virilism in adult women with adrenal tumors.

It is striking that we do not find any corresponding interrelation in men. We do not find any feminization of the boys who have adrenal cortex tumors. On the contrary, we find an accentuation of the virile elements, a phenomenon that should be considered rather as true precocious puberty.

As seen above, the relations here described have been explained from the point of view of a special connection between the adrenal cortex and the sexual organs, that the adrenal cortex produces a hormone which has influence on the development of the secondary sexual characteristics and that the tumors has caused a hypersecretion of this hormone.

We wish to make some critical remarks in opposition to this theory. First it must be said that it is not correct to conclude always from the coincidence of tumor and precocious development that the tumor causes the abnormal development. It might also be assumed that the precocious puberty or virilism could produce a disposition to the development of the tumors, or that both the tumor and the precocious puberty are expressions of a general abnormal development of the whole organism.

These views cannot be denied absolutely, although they seem less probable. It would be more easy to understand that the production of a certain chemical substance by the tumor may have a generalized effect on the organism because we see so many

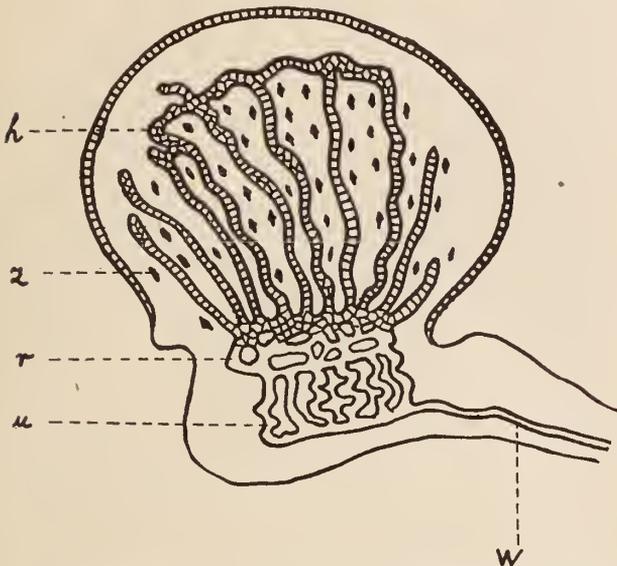


FIG. 1.—Development of the male sexual gland. (After A. Kohn.) The figure shows the pure testicular development; h, testicular channels; z, interstitial testicular cells; r, rete testis; u, midkidney; w, Wolffian channel.

analogies in the effect of thyroid, ovarian and testicular hormones, and in the hypertrichosis produced by pituitrin injections. On the other hand, we have not sufficient proof for the statement that the origin of tumors can be related to the precocious development, although a certain dysendocrine disposition may perhaps have some influence on the growth of tumors.

In consideration of the influence of the adrenals on sexual development another interrelation must be remembered. We cannot draw a conclusion of the normal function of the adrenal cells from the pathological function of the tumors. It must be remembered that we are dealing not with a simple hyperplasia, but with a development of malignant tumors, whose cells in many cases are very different from the normal adrenal cortex cells.

But apart from these questions there is one phenomenon which is striking: If the adrenal cortex really has any influence on the development of puberty, why then does hypersecretion in girls produce a male puberty and not a female? It would be difficult to explain this fact from the theory that the adrenal cortex normally has an influence on the female sexual development. It must be remembered that the influence on the sexual development which we know from the other ductless glands, such as thyroid and pituitary, is such that they are conditions for the male development in males, and the female development in females. And further, we know that although there is a retardation of puberty in cases of insufficiency of thyroid and pituitary, there is no precocious puberty in connection with tumors from these glands. Apart from the cases of tumors of the pineal body, which always have been teratomata destroying the pineal, not pineal adenomata or carcinomata, our knowledge of the

complication of tumors with *pubertas præcox* is only derived from adrenal tumors and tumors of the ovaries and testicles.

Considering all these facts, we believe that another theory could be advanced which could better explain the strange fact of adrenal cortex tumors producing a male puberty in both males and females and which could give a single point of view for the majority of cases of *pubertas præcox*: namely, hyperfunction of interstitial testicular or ovarian cells.

Marchand who has described adrenal hypertrophy in female hermaphroditism has related it to the development of ovaries and adrenals in fetal life. We will follow his example in trying to explain virilism connected with adrenal tumors in girls.

It is well known that the first seat of the adrenal cortex is developed from the mesentelium of the abdominal hollow; just beside the seat of the adrenal is the point of origin of the testicles and the ovary.

From the investigations of Laulanié (19), Janosik (17), Nagel (25) and Coert (6), whose results are accepted in the textbooks of Hertwig (16) and Broman (3) and confirmed in an important article by A. Kohn (18) as late as 1920, it is suggested that the origin of the ovary is hermaphroditic. While the testicle is developed nearly directly from the original undifferentiated stage, the ovary is passing through a stage in which the cortical part may be considered female, but the deeper medullary part is to be considered male, or testicular (Figs. 1-2); during the development the male medullary part remains rudimentary. It is this medullary testicular part that at a certain stage is intimately

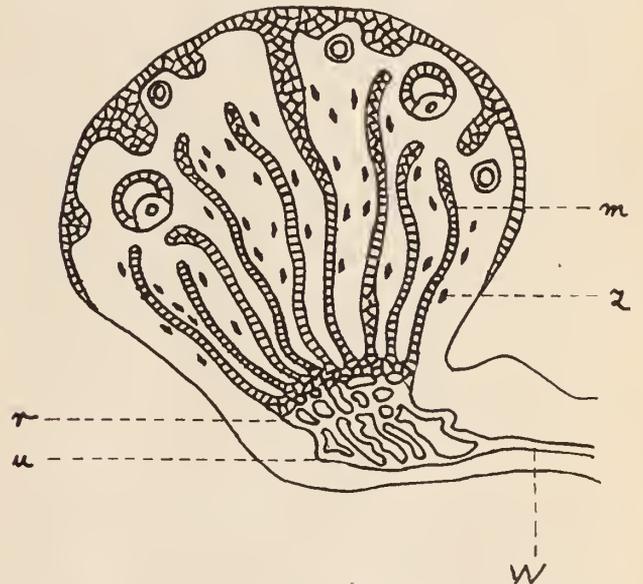


FIG. 2.—Development of the female sexual gland. (After A. Kohn.) The figure shows the bisexual development; the cortical part ovarian, the medullary part testicular; m, sexual cords (corresponding to the testicular channels); z, interstitial ovarian cells; r, corresponds to the rete testis; u, midkidney; w, Wolffian channel.

connected with the beginning stages of the adrenal cortex (Janosik).

This differentiation of development in males and females, pure testicular stage in male embryos corresponding to a hermaphroditic ovariotesticular

stage in female embryos, and the connection between the testicular part and the adrenal cortex, would then explain the difference in the onset of puberty in children with adrenal tumors, producing pure pubertas præcox in boys and male puberty signs in girls. The theory that could be based on this parallelism between fetal development and effect of tumors is the following:

The adrenal cortex tumors in the described cases are developed from an abnormally placed adrenal gland. The abnormality consists in the male part of the ovary not having been rudimentary, but absorbed by the adrenal gland and developed to a part of this. The tumor cells developed from the adrenal cortex are therefore not developed from adrenal cortex cells in an ordinary sense, but from cells which originally represented the roof of the medullary (male) part of the ovary. This relationship finds expression in the tumor cells secreting a hormone with characteristics of a testicular hormone; in other words, it produces male characteristics, causes virilism in girls.

In the four cases of precocious puberty in boys with adrenal tumors the onset of puberty is thought to have occurred in a similar manner. It is probable that in these cases the tumor is developed from an abnormally seated adrenal gland, a gland which in part is developed from the testicular foundation and whose cells therefore may produce a hormone like the testicular hormone.

In accepting this theory as plausible we conclude that the cases of adrenal tumor or adrenal hyperplasia connected with virilism or pseudohermaphroditism do not prove any special connection between the adrenals and sexual development, but that this connection may be just as well or even better explained by developments in early embryonic life.

But is such a connection indicated by other facts? Glynn says that in cases of pregnancy in some animals hypertrophy of the adrenals has been noted. But this does not prove that there is any special connection between the adrenals and sexual development, it may only be considered as an expression of the fact that in the course of pregnancy and the development of the fruit, extraordinary demands are made on the products of all the ductless glands, adrenal, thyroid and pituitary. The cases mentioned by Glynn, in which there has been atrophy of the adrenal glands with atrophy of the genital organs, do not prove any connection, since these atrophies may be considered as parallel symptoms of a pluriglandular insufficiency.

SUMMARY.

From the above considerations we draw the following conclusions: The development of pubic hair and beards in little girls with adrenal cortex tumors cannot be regarded as a special sign of precocious puberty but must be considered as a natural link in hypertrichosis. This hypertrichosis and the development of a large clitoris and transformation of the voice in little girls are only to be considered as a virilism, analogous to the virilism in adult women suffering from adrenal cortex tumors and the so called fetal virilism (female pseudohermaphroditism) in females with adrenal hyperplasia. Only in boys and in a single case of adrenal tumor in a girl aged ten years has there been found true pubertas

præcox. This theory has already been expressed partially by Glynn and Leiner.

Many authors conclude from these facts, that a special connection exists between the normal function of the adrenal cortex and the sexual organs, that a hormone from the adrenal cortex has a special influence in producing the secondary sexual characteristics. This theory does not seem to have sufficient basis; the presence of virilism in girls and women with adrenal cortex tumors, especially, cannot be explained by the suggestion that the adrenal cortex should have any influence on the normal sexual development in females.

A study of the interrelations in early fetal life will give an explanation which seems more plausible. Several investigations have shown that the ovary in its early stages is hermaphroditic. The outer cortical portion is ovarian, the inner medullary portion, testicular. This testicular part is at that stage connected with the adrenal cortex, which develops next to the genital gland from the mesentherium. In cases where adrenal cortex tumors have caused virilism, it seems most probable that the tumors have not been developed from ordinary adrenal cortex cells, but from such fetal testicular cells which have been absorbed by the adrenal cortex and developed to a sort of false adrenal cortex.

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The Problem of the Adrenals

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Once again the adrenal problem. *Multa renascentur quæ jam ceciderunt*. It was in 1856 that the French physiologist, Brown-Séguard, discovered the fatal effect of removing the two adrenal bodies. The results of Brown-Séguard's experiments were extensively discussed; in fact, for over thirty years the results were considered doubtful and frequently as inexact. It was necessary to wait until the years 1892-1893 and 1897, when the findings were placed beyond the realm of dispute and confirmed by the researches of two other French physiologists, Abelous and Langlois, and by those of Langlois. These researches opened the pathway to the study of the mechanism of the adrenals. But in the meanwhile in England, G. Oliver and Ed. Sharply Schäfer found that the injection of adrenal extract caused an acceleration in the heart rate, an increase in the energy of muscular contractions, and an elevation of arterial pressure. Shortly afterward an American, Takamine, isolated a substance from the adrenals, adrenaline, the action of this substance being identical with that of the adrenal extracts. The presence of this substance in the venous blood of the adrenals was demonstrated, and this venous blood, when a few cubic centimetres were injected into an animal, manifested the same properties as adrenaline.

There was the same confusion regarding pathology. Little by little the pathology of the adrenals was explained by their variations in the secretion. At times too little, at times too much adrenaline was secreted into the blood stream. This idea soon extended beyond the special application so that in all cases where there was an increase of arterial pressure or, on the contrary, hypotension more or less constant, it was explained on the basis of a hyperadrenalemia or a hypoadrenalemia. All became extremely clear. We had at once the cause and the mechanism of the existing difficulties. The ideal, always looked for in medicine, a pathogenic explanation, had been attained.

I

The whole subject has again been brought into question.

Upon what data does the theory rest? The adrenals produce adrenaline since we find the substance in the parenchyma of the gland and in the venous blood issuing from it. The purpose of this substance is to maintain the arterial tonus and consequently the pressure of the blood in the arteries, because in general it maintains the tonus of the sympathetic system. Numerous experiments have shown in fact that it is a powerful stimulant of all the sympathetic nerves. A. Biedl has summed up this whole conception in a phrase: "The maintenance and regulation of a tonic innervation in the realm of the sympathetic nervous system is a function of the internal secretion of the adrenal system." (1)

Now have we the right to conclude from the pharmacodynamic action of adrenaline its physiological rôle and to identify each of these? The latter is in no way implied by the former. They are separate entities as experiments have shown.

In the first place it has been proved that the adrenals are not necessary to the maintenance of arterial tonicity: in fact, the blood pressure in the arteries during the first hours after extirpation of these glands is normal or very close to normal (as shown by the experiments of Lewandowsky, 1899; L. Camus and J. P. Langlois, 1900; Young and Lehmann, 1908; Young, 1909; R. G. Hoskins and McClure, 1912; Gley and Quinquaud, 1917). Neither is adrenaline necessary to the tonus of the sympathetic system; the experiments of Gley and Quinquaud (1916-1918) have shown, for instance, that the excitability of the splanchnic nerve is not in the least modified by double adrenalectomy or the ligation of the two lumboadrenal vein trunks.

On the other hand, it is perfectly definite that the blood in the adrenal veins contains adrenaline and that it contains more during stimulation of the splanchnic, but it does not follow from this that the substance thus liberated from the adrenal tissue acts upon the organism. To declare that a glandular product constitutes an internal secretion and as such has an effect upon the organism requires more than the mere recognition of its presence in the venous blood of the organ where it is formed; it must still be found in the blood of the left heart or in the blood of the general circulation; for it must pass into the circulation in order to reach the tissues upon which it shall act electively. Nothing proves *a priori* that the product found in the blood issuing from a gland issues into the general circulation; in fact, it might decompose or be rapidly destroyed in the mass of blood or else it might be diluted to a point where it would no longer have any effect. It is, therefore, highly necessary that it should be found in the arterial blood if we are to affirm its hormonal character.

There is a still more profound reason for this. I have maintained for a long time that the physiological destination, the purpose of the secreted product, really gives significance to a secretion. Since 1893 I have laid down this principle as the basis of a classification of glands (2). As far as the internal secretions are concerned the destination is indicated by the passing of a specific substance from the venous blood of a gland into the general blood stream and only the physiological properties of the venous blood, temporarily acquired by the blood of the aortic system, can prove it. To characterize an internal secretion, therefore, we must be able to find again in the blood of the left heart or in the arterial blood stream an active principle with properties to show its presence in this blood.

Has such investigation been carried on for adren-

ance? To be sure very minute traces of this substance have occasionally been found in the blood (Bohring and Trendelenburg, 1911); but other workers (O'Connor, Cannon and De La Paz, Dörberg) have not even detected these small amounts. The experiments which Quinquaud and myself have carried out systematically for the purpose of tracing the course of the adrenaline from the adrenal vein to the heart, and to try to find it in the blood of the left heart in a physiologically efficacious degree, have shown us that it is not to be found either in the blood of the vena cava above the hepatic vein or in the blood of the heart. In the passage from the adrenal vein to the right heart it is thus destroyed or diluted so much that it no longer reveals its properties. From these experiments we have concluded that there is no such thing as physiological adrenalemia.

This has important consequences. The function of the adrenals is not to secrete adrenaline to a degree where the product plays a physiological rôle. It is important to restudy the functions of the adrenals. From the pathological viewpoint the revision of the present ideas upon the so-called syndromes of hyperadrenalemia and hypoadrenalemia is no less urgent.

II.

The majority of the physiologists, in fact practically all, have already abandoned the theory that arterial tension depends upon the secretion of adrenaline (3); but many have not renounced the theory which is called the occasional secretion, the so-called "emergency function" of Cannon. They admit, with Cannon, that in certain conditions, under the influence of the emotions, of pain, of asphyxia, adrenaline is secreted in a sufficient quantity to pass into the blood of the general circulation and so play a physiological rôle.

And regarding asphyxia, this thesis has no support. G. N. Stewart and J. M. Rogoff (4) found that asphyxia did not increase the excretion of adrenaline, and Gley and Quinquaud (5) have demonstrated that the well known cardiovascular phenomena that are produced during asphyxia are the same before and after double adrenalectomy. On the other hand, it may be observed that all the emotions do not give rise to the reactions of excitation; there are the depressive emotions, those of sadness, which in no way accompany the phenomena of excitation in the domain of the sympathetic, and it is therefore doubtful whether all the emotions bring into active play the splanchnic system and as a result of their physical effect produce a hyperadrenalemia. But it is better to stress the significance of the experiments of Gley and Quinquaud to which I have just referred, in order to understand that the reactions dependent upon the excitation of the splanchnic remain the same after the extirpation of the adrenals; if this is so, as the emotions can evidently not work upon the adrenals except through the agency of the splanchnics, we are obliged to admit that the increase in adrenaline, found by Cannon in animals which have been frightened, has not the value which this physiologist has supposed. G. N. Stewart and J. M. Rogoff (6) observed that cats, which had one adrenal removed and the nerve

of the other adrenal cut, did not excrete any more adrenaline than did normal animals under these conditions when they were subjected to anger or fear. In spite of these facts, the theory of the "emergency function" is always strongly supported by its principal author (7).

It would take too long and this is not the place to go into the details of his criticism of the experiments of Stewart and Rogoff and of Gley and Quinquaud. To the first of these we have already replied (8). For myself I only wish to present at this time certain considerations of the subject of an experimental and also of a theoretical nature. In order to study the rôle of the adrenals, as in all other endocrine glands, one of the surest methods is evidently the complete extirpation of the organs; then one observes the phenomena on which one plans to base one's study. Many experimenters consider as equivalent to double adrenalectomy the ligation of the two venous trunks of the lumboadrenals; the operation is more simple and more rapid. Cannon (9) refers to anatomophysiological studies of Cow (10) and after a number of personal experiments maintains that it is less sure: there exists certain direct venous connections between the adrenals and the renal vein. "From these observations," says Cannon, "it is clear that conclusions based on results obtained when only the lumboadrenal veins are tied, may lead to erroneous conclusions" (11). One could, consequently, place under suspicion the experiments in which Gley and Quinquaud observed the effects of the stimulation of the splanchnic where there was no modification after the ligation of the two lumboadrenal venous trunks. But then one could probably suspect all the experiments made by this method. Now Cannon did not cease to attribute great importance to the experiments of Anrep (12), in which the vascular reaction following the stimulation of the splanchnic appeared very different before and after "the exclusion" of the adrenals. This exclusion only attained by the ligation of the adrenal veins, as well as by the ligation of a single venous trunk, on the side of the stimulated nerve. If in the experiments in which Gley and Quinquaud ligated the adrenal veins, it would be stated that nevertheless adrenaline passed into the circulation, the same supposition could be held for the experiments of Anrep. One cannot hold that one experiment is valid and the other erroneous. The principle which would cause one to be rejected should also cause the other to be laid aside. As stated in an old French proverb, *donner et recevoir ni sont*.

Another reference of the same character. In the researches of Gley and Quinquaud upon the effects of the stimulation of the splanchnic they were not only experiments made upon the ligation of the adrenal veins, but also and more frequently, experiments upon double adrenalectomy. It is this method to which we resorted most frequently; and we never relied exclusively upon the ligations, we only used it as an accessory. Therefore the majority of our experiments complied with the desideratum expressed by Cannon (13): "The only absolutely safe method is that of excluding the glands from any possible action in the body by removing them." It is not right in an examination of the ideas set forth by Gley

and Quinquaud to ignore the results of their experiments of adrenalectomy in order to take into account only their experiments of "exclusion."

The rest of this paper is of a more general order. If adrenaline plays a rôle in the production of organic reactions which accompany the emotions, for example, and characterize them physiologically, it is not understood why these reactions are limited to a certain definite territory. For adrenaline, poured into the circulation by the adrenal veins, should exercise an equal action upon the entire arterial territory. And this is precisely what does not occur. This causes us to think that it is not by a humoral mechanism (by adrenalemia) that these vascular reactions of an emotional origin are produced. It is perhaps only by a nervous mechanism. This mechanism is well known since the memorable work of Claude Bernard. It is because there exist vasomotor nerves which may cause an independent interplay that the local circulation is possible. The theory of adrenalemia is irreconcilable with the conception of local circulation. Adrenaline can only cause a common modification of the general circulation, since, once it is excreted, it is supposed to go everywhere and work in the same way on all the vessels (excepting the coronaries). The characteristic of local circulation is an independence of the general circulation, and in consequence as opposed to the general causes of the variation in the general circulation, and also their independence, one in relation to the others. May we recall the celebrated phrases of Claude Bernard? "There are, in reality, two circulations for the physiologist and for the physician: first of all the general circulation, that which Harvey made known to us: then the capillary circulation regulated by the nervous system, which acts separately for each of the organs . . ." (14). "The only general circulation, that which has been known since Harvey, does not give us any explanation of the numerous circulatory variations in the organs which follow the states of activity or rest and follow the normal or pathological states. The discovery of the local circulation and the rôle of the vasomotor nerves explains to us how each organ, each element, may have, as we may say, its independent circulation, its special nutrition, and, as a result, its function distinct from that of its neighbor" (15). Between the theories of physiological adrenalemia and the idea of local circulation, so solidly established by countless experiments, there is a contradiction.

III

From all that has preceded, it seems to me that one of the essential results of the experiments followed for many years by Gley and Quinquaud was to make known the autonomy of the splanchnic nerves, the independence of their action and the nonsubordination of this action to the secretion of adrenaline, always continues, and it is inevitable that our results should oppose the theory of emergency function. But if this theory, like that of tonus, is discarded, if the adrenals can no longer be considered the secreting organs of a substance which has a regulating effect upon the circulation, what is their function? We can come back to the earlier experiments of Abelous and Langlois relating to an antitoxic rôle of the adrenals, and, starting from

that viewpoint, make new investigations; and we might ask whether, in conformity with a view of Biedl and of Swale Vincent, the adrenal cortex—that is to say, the nonadrenogenous layer—is not essential to life, and turn our searchings in that direction. And one might conceive of still further directing hypotheses.

However this may be, once again there is the adrenal problem.

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James Theory of the Emotions in Relation to the Adrenal Glands.—Charles E. Kieley (*Journal of Laboratory and Clinical Medicine*, January, 1921) carried out the therapeutic tests reported on two psychasthenics whose most prominent symptom was fear. Accepting the theory of James that we cannot experience an emotion unless we also experience the physical changes that habitually accompany it, and that of Cannon and his coworkers that the physical concomitants of fear were produced through psychic stimulation of the adrenal glands, it follows that a blocking of the adrenal hyperactivity should prevent the experience of fear. The author gave his two patients fifteen and twenty injections, respectively, of one to two c. c. of apocodeine solution, the only known substance which neutralizes adrenaline physiologically at all points, according to Biedl. This did not give the slightest relief from fear in either case. Kieley concludes that, granting that Cannon's contention in regard to the bodily effects of fear be correct, the two experiments reported indicate that an emotion can be experienced independently of the physical changes which habitually accompany it.

Evolution from Status Thymicolymphaticus

The Successive Phases and Their Treatment

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Medical literature for many years has sporadically produced a variety of glimpses into status thymicolymphaticus,—from the viewpoint of the pediatricist, or the internist or some other specialist who had become interested in the condition because of its bearing in his particular field. Warnings were always uttered as to the importance of its recognition for always did its presence modify symptomatology, treatment and prognosis. But never has any real attempt been made to trace the progress of status thymicolymphaticus through the developmental years to adult life and to mark its metamorphosed characteristics and the attempt of the individual to compensate for its disturbances. In the past ten years it has been my fortune to examine many hundred cases of status thymicolymphaticus in all stages of development including adult cases, in whom the early history gave indubitable evidence of such disturbance; and as a result of a more or less comprehensive study of these cases, certain general conclusions have been drawn which I shall attempt to present, together with the facts upon which they are based.

Reviewing the general symptomatology of status thymicolymphaticus as a basis from which we shall proceed, I give hurriedly the outstanding features of this condition.

Skeleton.—Growth of skeleton is usually abnormal in that the various units are in disproportion—thorax too long for legs, and vice versa; hands and feet too long for arms and legs; bony structure usually frail and rachitic evidences are frequently present. A maxillary torus is in evidence.

Teeth.—Almost invariably there is delay in permanent dentition with prominence in size of the central incisors of the upper jaw, with comparatively small lateral incisors, and canines that have lost, or rather not acquired the fanglike shape, but resemble the incisors in that they have a cutting edge. The molars appear very late.

Joints.—The tendons about the joints are loose and hence dislocations. Subluxations are frequent together with ability to produce marked contortions of the body. The extremities are like flails and the whole skeleton is of a loosely put together character. The apparently fixed joints, such as the sacroiliac, become partially movable and hence are the seat of intense backache on fatigue. Like conditions obtain in joints of the foot, and pes planus is the result.

Skin.—The skin is soft and velvety, covered with lanugo, frequently with a marked blush on the cheeks—a typical peaches and cream complexion. The bluish vessels are easily seen through the translucent skin.

Hair.—While lanugo covers the parts which would later be provided with secondary hairy growth, yet such later growth is very late in appear-

ance. Axillary hair and pubic hair do not come in until long after the usual time for the arrival of puberty, and in the boy, beard and mustache are still later, and then very sparse. The growth on the head is, however, profuse.

* *Genital system.*—In the boy there is usually retardation in growth of the genitals, and not only this, but the growth is of undifferentiated character, so that there is a fold of the scrotum which partially or even entirely surrounds the base of the penis, resembling the labia in the female. Occasionally, one or both testicles are undescended and there may be hypospadias. In the girl, the clitoris is usually disproportionately large, the menses come on late, and are delayed and irregular.

Eyes.—The pupils are usually large and mobile, the sclera, clear bluish white, and the vessels of the fundus are extremely thin in calibre, without engorgement of the veins.

Endocrine glands.—The thyroid shows no abnormalities in size, although it is usually underfunctionating; the thymus gland is present and large, even after the twelfth year. Percussion and röntgenography will confirm this. The picture should be made at the end of a long expiration. The adrenals are invariably deficient, both as to size and chromaffin content. Indeed, the chromaffin tissues throughout the body are deficient. The pituitary gland is usually small and is encased in a sella turcica which is small and enclosed by the clinoids. This fact is of great importance in the further history. The gonads are usually small and delayed in development and in differentiation.

Vasomotor system.—The bloodvessels are of small calibre throughout the body, especially the aorta and the coronary arteries. The heart is small.

Viscera.—Frequently a tendency to splanchnoptosis. Incontinence of urine; enuresis.

Laboratory findings.—Blood: red blood cells and hemoglobin usually normal; white cells show a marked relative lymphocytosis with a low polymorphonuclear count, which at times is as low as five per cent. Usually an eosinophilia is present. Blood sugar is usually low,—.08 per cent., .060 per cent. Of importance is the carbon dioxide tension of the blood plasma, which is invariably low, minus forty-five to fifty per cent. The coagulation time is prolonged, often as long as fifteen minutes. The urine has a low specific gravity, and not infrequently shows the presence of acetone.

General observations.—From the foregoing, the symptoms exhibited by the patients are readily understood. These are fatigue and dyspnea on exertion; fainting attacks and collapse in critical situations; syncope and death in narcosis, fright and exhaustive demands. The symptoms depend upon the low chromaffin supply, the small bloodvessels,

the low blood sugar and the tendency to acidosis. Death is not due, as has been thought, to pressure of the thymus on the trachea,—or at any rate, only in the rarest cases, but is due to adrenal exhaustion. Urticaria, asthma, acidosis, enuresis, hay fever, circumscribed edema, arthritides, are all concomitants. Blood pressures are low, pulse pressure frequently down to 10 or 15 mm. The low adrenal efficiency gives a Sergeant's line on stroking the skin of the abdomen.

From the general description, no matter what your field of work may be, you will all recognize cases that have come under your notice. These patients do not all die in growth or adolescence, nor do even a large number of them. What becomes of the survivors? How do they manage to maintain themselves in the struggle for existence? Do they constantly remain a prey to their deficiencies? These questions possibly can now be answered. The development and evolution out of status by the individual's intrinsic powers of compensation and adaptability form one of the most interesting chapters in modern medicine and their recognition will enormously aid us in our power to help hitherto obscure and apparently adventitious symptoms in our patient's progress, no matter what his ailment, no matter what our speciality.

The very first consideration in the difficulty of adaptation to environment of the status case is the outstanding fatigue. This, as has been said, is due to several factors,—the adrenal insufficiency, the low blood sugar content, the low alkaline reserve and low blood and pulse pressures. If there were any possibility of overcoming these basic difficulties, a large measure of improvement would take place. But is there in the human economy any possibility of such autonomous regulation? If, for instance, splanchnic stimulation, such as is efficient in shock, were to occur, might the situation not be overcome? The stimulation of the splanchnics or the sympathetic system generally, depends for its effect largely upon an adrenalin reserve. This is wanting in the status cases. Stimulation by thyroid secretion also depends upon the sensitization of the neurovascular synapse by thyroid extract to the action of adrenalin. Again the same difficulty.

But there is one tissue which will produce the wherewithal,—independent of adrenalin—to increase blood pressure and blood sugar content, and that is the pituitary body. Does increasing activity of the gland actually occur? For a reply we must go to our case histories. We find here two groups of status cases, one, by far the larger, in which the sella turcica on x ray examination is found to be small and enclosed; and the other in which the sella is presumably normal in size and conformation. The symptomatology in the two cases is different in important particulars, and it is the former group which is of interest to us now. In the small, enclosed sella group there is always associated with the fatigue states, headache. This headache is intratemporal in situation, of intense, painful boring, or pressure, or throbbing in character, and more or less periodical in its onset. Its periodicity is menstrual or seasonal; and yet it may be produced by any factor which will stimulate the pituitary gland.

For instance, the ingestion of large quantities of carbohydrate food; cerebral hyperemia due to the intense cerebration of long continued worry or chagrin or mental effort; injections of anterior lobe pituitary extract; and similar stimulants. Just before the headaches begin, blood and pulse pressure are low in our cases, while during the headache period, both rise, as does the blood sugar content. After a year or two or three of such constantly recurring headaches, interesting data are available. These are as follows:—Blood pressure, pulse pressure and blood sugar content are all on a higher level; there has been a rapid increase of skeletal growth; and an x ray of the skull shows a sella turcica that presents erosions and thereby an enlargement of its cavity. With these facts at our disposal, I believe that the conclusion is not very far-fetched that pituitary hyperactivity has occurred and with it an amelioration of the asthenic symptoms. In other words, there has been a compensation process inaugurated automatically, which has served to overcome many of the symptoms of disability possessed by the status case. This compensatory process precedes for years, the sella turcica becoming more and more eroded, the headaches gradually becoming less and less intense and less frequent, the skeletal growth, however, going on apace. Now, other symptoms of pituitary primary activity and other glandular activity secondarily, begin to present themselves. There is gonadal growth; undescended testicles come down; secondary hairy growth begins.

The young man that has reached this period of compensation gives somewhat the following picture. His age is twenty; he is six feet or more in height; his skin, while still smooth and velvety, has begun to look more rugged. The first hairs of mustache or beard are beginning to show themselves. His pubic hair, which has been for a few years scanty and feminine in its distribution, begins to encroach on the middle line of the abdomen towards the umbilicus. His joints are loose, subluxations of the mandible or of the carpal metacarpal joints being readily produced; he has the large central incisors of the upper jaw; a torus palatinus is evident—but he is getting to be more efficient in his study and in his play, and his fatigue is diminishing. He still has headaches, sometimes very severe. It is for this symptom that he sees the oculist, or the rhinologist or the internist or the neurologist. Careful inquiry into his developmental history will elicit many symptoms of the foregoing group, and he will be recognized as being in a transitional stage of compensation from an early status thymicolymphaticus. The rapid skeletal growth and the headaches will lead the careful clinician to examine the sella and the thymic region and there the telltale marks of his progress will be seen. At once it will be recognized that the extreme height and the headaches are simply the hallmarks of a purposeful compensatory process on the part of the pituitary gland to overcome the disabling characteristics of a status thymicolymphaticus, and are not disease symptoms in themselves. This is highly important to know both for purposes of treatment and for prognosis. As we watch his progress through the years, he goes on growing,

though less and less in degree; his headaches come on only after undue fatigue or exertion; the thymic x ray shadow disappears; he may grow both mustache and beard; his blood pressure, pulse pressure, blood sugar content, coagulation time,—all approach normal, and finally even his growth ceases. We have before us, a moderate giant, six feet two inches in height, who has finally matured, physically, psychically and sexually at the thirtieth year of life instead of at the twenty-first. He will always be conscious of some limitation to his physical possibilities, but will be able to survive in competition with his fellows. In other words, he has gone to cure through spontaneous compensation. Looking back over his career, the recognition of the milestones of his progress gives us the keynote of the treatment which we may accord his less fortunate brethren in their partial or complete failure to follow his trail. That keynote is the ability of the pituitary body to become hyperactive in order to compensate for the initial adrenal insufficiency. It is incumbent upon us, therefore, to recognize those cases that continue to exhibit various degrees of thymic disturbance in their later life and, secondly, to estimate the ability of the pituitary to compensate.

These patients, besides the original structural abnormalities described in the opening chapter, exhibit especially, a, fatigue, b, low blood and pulse pressures, c, low carbon dioxide tension of the blood plasma, d, long coagulation time, e, various vagotonic stigmata, such as visceroptosis, hypermotility of stomach and intestine, urticaria and angioneurotic edema, cardiospasm, esophagospasm, high gastric acidity, angmoid attacks, attacks of syncope and so on. These symptoms are important in every field of medicine and play an extremely active part in each symptom complex. The danger lies in considering them as disease pictures in themselves and not as mere symptoms in a universal syndrome whose basis is a subinvolted thymus gland, uncompensated. The recognition of continuations of the above intruding themselves into our patient's complaints will make for more thorough diagnoses and more thorough basic rational treatment.

As we have seen that automatic compensation of a thymic state depends upon potential hyperactivity of the pituitary body, we must estimate this possibility by the very means as yet in our power, namely, the size of the sella turcica, and its freedom from complete enclosure. As before stated, the two large groups of our cases are separated on a basis of sella turcica conditions; the small enclosed sella giving rise to the pressure symptoms, with headache, growth, and gradual amelioration of the symptoms provided the sella become eroded and enlarged.

The normal sella group have at most only intratemporal pressure symptoms of a mild degree, but growth has been rapid and blood pressure, pulse pressure and blood sugar have gradually risen, and with this rise, a general improvement in the asthenia has taken place, and in a comparatively short time, our patient is normal and no longer interests us.

Furthermore, with a large, roomy sella from the very beginning, compensation may occur without any symptoms whatever and the case never comes to observation.

There is still another possibility, namely, that the small, enclosed sella will resist enlargement or that the pressure exerted within it is never sufficient to produce such enlargement. In either case, an inefficient pituitary activity leaves the patient at the mercy of his thymic subinvolution. At this point our therapy becomes effective.

Having decided then that our case presents the earmarks of an early thymic subinvolution, it is our function next to determine the phase of compensation at which the patient has arrived. An x ray examination of the chest and skull will help. The chest may still give evidence of a persistent thymus gland, although the absence of a thymic shadow is not necessarily proof of the absence of the thymus. The skull, however, will show a sella turcica of one of the following types:

- a, small enclosed, no erosions.
- b, small enclosed, with erosions.
- c, medium size, smooth wall, open between clinoids.
- d, medium size, eroded walls, or clinoids, or both.
- e, enlarged with evidences of extensive erosions.

Type a is of the noncompensating group of cases. This group requires constant treatment, probably throughout life.

Type b shows beginning compensatory enlargement, judged by the eroded walls of the sella, and requires treatment for the compensatory effort.

Type c is a normal sella which may or may not enclose a hyperactive gland, and in which treatment will depend upon the efficiency of the hyperactivity.

Type d is of normal size but has been made so by constant pressure, as witnessed by the marked erosions. In this group of cases there is usually a history of long continued, severe headache of migrainous character, intratemporal in situation and frequently of ophthalmoplegic type. This ophthalmoplegia depends upon the lateral encroachment of the pituitary body to the cavernous sinus. The sinus conveys the third, fourth, sixth, and ophthalmic division of the fifth cranial nerve within its walls and pressure upon it, of the pituitary body will involve one or even all of these structures. Hence the symptomatology will include, during the headache, diplopia, strabismus, ptosis, pupillary abnormalities and so on. The radiologist will often report such a sella turcica as normal in size, without suggesting erosion, not recognizing that the normality in size is simply a transitional state from small to large. This is of importance to recognize.

Type e is the final state of a sella turcica in cases in which complete compensation may have taken place with gigantism, or acromegalic features, but with normal blood pressures and normal blood chemistry.

By means of these examinations, together with the patient's symptomatology, we can arrive at some conclusion as to his present whereabouts, in the progress to complete compensation. I divide the entire period of evolution into periods; first, the actual status of origin; second, the period of beginning compensation with beginning rapid growth, headaches and symptoms, both physical and psychological of an underdeveloped pituitary body; third, the period of enlargement of the sella turcica with a gradually decreasing fatigue, decreasing headaches, and a slowing down of growth; and fourth,

the terminal period, in which the condition becomes fully compensated, with cessation of growth and of headache, and much moderation of fatigue.

The difficulties arising in each of these stages have been only lightly touched upon in the foregoing; but each period has a host of major and minor attributes that only a long experience will make familiar. I would like to mention here chiefly the mental disturbances with their concomitant behavioristic anomalies. During the second and third stages, namely, those of continuing compensation, the individual contending with his headaches and fatigue cannot give proper thought nor consecutive attention to the problems before him. As a result, he falls behind his more fortunate brothers in school and college and becomes backward in intellectual development. Realizing his inability to compete with them, he likewise separates himself from their company and their games, and becomes shut in. This leads to various psychic phenomena, with morbid thoughts and fears and a more or less depressive state supervenes. One curious condition which we have often seen in our patients at this stage, in those with small enclosed sellæ turcicæ, is a lack of inhibition which manifests itself in a variety of ways. They do and say the first thing their environment impels them to, without allowing judgment to enter until too late. Thus many of our patients are pathological liars, kleptomaniacs, moral inferiors and drug habitués. They always avoid obstacles by the means nearest at hand, and never by any chance either endeavor to overcome them, or make early provision against them.

When compensation is complete, however, or treatment is instituted early enough, many of them are improved in these regards as well as in the matter of their physical disabilities. A certain number of patients never compensate, the sella remains small and enclosed, and their lot is constant observation and treatment.

So that we see in the evolution from status thymicolymphaticus a series of stages involving a symptomatology which encroaches upon all fields of medicine from surgery to psychiatry. The tangential points are the ones that all of us must watch for, and once found and recognized, are the keystones to a complete understanding of the patient.

A knowledge of the dynamic process going on in our patients, and of the goal that the autonomic procedure is striving to attain, is the groundwork of our treatment. To recapitulate, the pituitary must do additional work to increase blood sugar and blood pressure, for the adrenals are inefficient. Then the active thymus must be inhibited. The lack of differentiation in structure and gonadal characteristics of the thymus cases may be partially overcome by the administration of small doses of thyroid gland and of iodine. This is based upon recent investigations on the positive effect of thyroid gland and iodine upon differentiation in lower forms of life. The thyroid dosage should be low, one tenth grain daily; or of thyroxin, Kendall's product, a half milligram daily or on alternate days only. Iodine in one or two drop doses, well diluted, or in the form of sodium iodide, grains five, on alternate days will suffice. If the thymus remains large, it

should be x rayed at periodical intervals, depending upon the urgency of the case. But the chief treatment must be directed to increasing the pituitary supply. In those cases in which the sella shows much erosion with gradually increasing efficiency on the part of the patient and a diminution of headache, no treatment at all is indicated. But where the effect of compensation is not apparent, the fatigue and headache persist, then pituitary medication is essential.

The correct administration of this product is extremely difficult to outline, for there are certain times when it increases the headache in individuals. and frequently, if continued without intermission, a gradually diminishing effect is seen. Personally, I begin with a quarter grain capsule of the whole gland, given once daily on an empty stomach. Frequently, after three or four days, the patient complains of pressure in the head, intratemporally. I then omit giving it for a day or more, and begin again. In girls, it is usually omitted a few days before the menstrual period, for it increased the headache usually present at that time in them. Gradually, with this small dose, conditions improve. If not, the amount is slowly increased, but given intermittently as before. Rarely do I exceed a daily dose of three or four grains. The patients, before very long, begin to feel the good effects of this treatment and become expert in their own cases, so that they can tell when and how much glandular extract to take. Stimulants of the sympathetic nervous system are efficient in tiding over especially severe periods of weakness. These include coffee, atropine in small doses, and alcohol in small doses. One might think that suprarenal gland extract or adrenalin would be of good effect. The former sometimes is of service in conjunction with pituitary feeding, but adrenalin usually is not. After ceasing the administration of adrenalin by mouth, the blood pressure usually falls below its former height. And when given hypodermically, the reaction is frequently bad and leads occasionally to syncope. Its effect is much like that of cocaine in these cases,—rapid adrenal exhaustion takes place due to intense stimulation of the splanchnics. Administration of alkalis—carbonate or bicarbonate of soda several times daily is of the greatest service in combating the low alkaline reserve.

Apart from active treatment, it is necessary to enjoin certain measures on our patients. They should not subject themselves to, 1, exercise, especially of a competitive nature, except in extreme moderation; 2, cold water bathing; 3, excessive ingestion of carbohydrates; 4, too intense application to any one task for a considerable period; 5, worry, anger or emotional strain; 6, narcosis, especially chloroform, cocaine or its derivatives.

They should have air, sunshine, and much rest. Food should be taken frequently in moderate quantities. Adjuvants of all kinds will readily suggest themselves in the conduct of any one case and of course the special treatment involving any particular organ of little resistance must be carried out.¹

¹ Case histories belonging to the evolutionary stages may be found in *A New Pluriglandular Compensatory Syndrome* by Walter Timme M. D., in *Endocrinology*, July-September, 1918, Volume 2.

Endocrine Dyscrasias in the Production of Epileptic States*

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It can be said almost axiomatically that when the definition of the etiology of a disease requires more than three words, its true causation is unknown. This applies with equal force to the epilepsies. The etiology varies from an attempt at a fixed pathology involving the cornu ammonis and other anatomical structures, down the list to the failure of adjustment of the patients' deep instinctive levels.

Tramer (1), who has studied the structure of the brain intensively, has recently shown that there is no true pathological condition peculiar to this disease. Clark (2), who has approached the study of the epilepsies from the clinical psychological side, has not been capable of distinguishing an organic epileptic attack from one of psychogenic origin.

The mechanism of epilepsy has been definitely shown through the work of Sherrington (3) on cerebrate and decerebrate animals, also Prus (4), Hering (4), Nino Samiajo (4), Rothmann (5), Gowers (6), and others. There is, however, no unanimity of opinion as to the force that provokes this mechanism and incites its periodical manifestation. To attempt explanations of the various conceptions is beyond the scope of this paper. However, there are several avenues by which the subject may be approached from a practical viewpoint. These eventually converge and coalesce to a single point, i. e., the endocrine system.

First, at the level of the vegetative nervous system; second, through the finer biochemical cellular metabolism (calcium, phosphorus, sodium and magnesium), and third, at the level of dyscrinism.

VEGETATIVE NERVOUS SYSTEM.

The physiological conception or rather pathological physiological existence of sympatheticotonic and vagotonic states as disease entities, being offspring of the vegetative nervous system, showing definite pharmacodynamic partitions, paralleling to a great extent the activities either paramount to, or subservient of, the endocrinous glands, opens up a veritable *sesame* regarding the concept and mechanism of this disease.

The Vienna school of Eppinger (7), Hess, and others have somewhat modified their views, and they are not as dogmatic as they were in their original schema. I must confess that I have been unable to find a pure case of either type described, despite the careful study of hundreds of cases coming under observation.

The control of the vasomotor system by the vegetative nervous system is an acknowledged fact, but that the epileptic attacks are induced as a result of a pure physiological vasomotor constriction cannot be accepted. Attacks of unconsciousness often simulating the epilepsies as in Ménière's disease (with its attending vertigo, mentioned by Gowers) (6), and the attacks of syncope, do not show, in the

main, any other points of contact. The syncopal attack shows an enfeeblement of the pulse and a feeling of faintness preceding unconsciousness, whereas in the epilepsies the pulse is normal, the face is cyanotic instead of pale, and unconsciousness comes on suddenly. The onset of the attack is also different.

One Japanese observer who compressed both carotids of epileptic patients produced typical attacks of epilepsy in a number of cases, but none were induced in normal individuals or in patients suffering from other diseases, showing that some other factors must be present in epilepsy.

It is interesting to note in this connection that Rossolime (8) has placed the vasomotor control as far up as in the frontal lobes, while Bechterew (8) placed it in the internal capsule, the caudate nucleus and the thalamus. Sajous (4) has pointed out that the superior cervical ganglion which has three nerve bundles sends two to the eye and its muscles, and the third accompanies the internal carotid which finally has been traced to the pituitary. Of still further interest, the peripheral circulation has recently been found to be capable of assuming an autonomous function (venules and capillaries) either through its nervous mechanism or directly through chemical factors (9). This in part may explain the various types of cyanosis and local patchy anemias in the epilepsies, phenomena seemingly contradictory and heretofore not solved.

So we can summarize by stating that while the vegetative system through its vasomotor mechanism is capable of producing unconscious states, it is incapable of producing genuine epilepsy (for it presupposes previous altered cellular metabolism) which exhibits itself both in character of attack and periodicity.

CELLULAR METABOLISM.

Gowers's (6) realization that epilepsy is due to some chemical affecting the nerve cells showed his profound grasp of this puzzling disease. In approaching the epilepsies from the level of perverted neurocellular metabolism, one can dip into a broad field of conjecture and theory. However, there are a few outstanding facts worth noting. Most glands of internal secretion control calcium metabolism, particularly the parathyroids, the pituitary, thymus, and adrenals. In tetania parathyreopriva, calcium metabolism is profoundly disturbed in the tissues. The works of Ott (10), Biedl (22), MacCallum and Vögtlin (22) have shown that the exhibition of calcium salts stops the tetany and convulsions resulting from parathyroid extirpation. In the absence of the parathyroids, these convulsions ensue. Here unquestionably perverted cell metabolism arises and as Schäfer (10) states, "The parathyroids yield to the blood a special autocoid—presumably of a chaloneic or restraining nature—which tends to prevent overex-

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citation, or discharge of nerve cells." Paton (10) and his coworkers believe it is due to guanidin. Sabbatini (11) states that the application of sodium makes the brain more irritable and excitable; these properties being lessened by the application of calcium. Substances that precipitate calcium heighten the excitability of the nerves. It may be due to this that a salt free diet decreases the number of attacks in an epileptic.

Prior and Jones (11) cite three cases showing evidence of parathyroid convulsions in which the patients were benefited by the administration of parathyroid substance. These workers have done the best work up to the present time on the calcium metabolism relative to the epilepsies, particularly on the urine and blood. Their investigations show that before an attack there is an increase of calcium in the urine and a diminution of excreted phosphates. After the attack an increase of both phosphates and chlorides is found. Again, the alkalinity of the blood in epileptics is diminished and it falls still lower preceding the attacks; this is accompanied by a concomitant fall in the leucocyte count. After the attack there is an increase of leucocytes and a rise in the calcium and alkalinity of the blood. Barr (11) has shown that the administration of phosphoric acid increased the frequency of attacks in epileptics. These investigators conclude that the calcium metabolism is the common ground upon which all glandular function is concerned in the epilepsies and therefore is the cause of epilepsy. This, in my opinion, is not the answer to the whole riddle. While a great number believe with Gowers that there is a chemical basis, there is a more subtle change in the cellular metabolism than is stated in the theory advanced by these workers. The stage of preparenchymatous change in all tissues is always first attended by finer biochemical changes of metabolism. The vegetative system is the intermediary attendant upon all these metabolic changes, whether nervous or otherwise. This has been shown by the study of visceral neurology. This is illustrated by the fixed pathological findings present in Wilson's disease, cirrhotic liver and lenticular degeneration, in fact the entire group of dystonia lenticularis as advocated by Thomalla.

ENDOCRINE DYSCRASIAS.

Von Monokow (12) states, in speaking of the embryological endocrine activity, "the endocrine system is well developed at a period of fetal life when the essential structures of the brain are lying in deep slumber." Just as the endocrines are directive in our embryological phase of existence, so, too, in our afterlife the endocrines make us what we are.

The functional activities of the endocrines are interrélated, and will often show symptoms not referable to the gland primarily affected. This must be taken into consideration in attempting to elucidate various phenomena as they arise in the dyscrasias.

PITUITARY GLAND.

Deficiency of the pituitary resulting in epileptic states is an established clinical fact. Any lesion perverting or causing a diminution of the secretion of this gland, or preventing it from entering the third ventricle through the infundibulum will eventually induce states of epilepsy. This has been pointed out

repeatedly, particularly by Cushing. Whether the secretion is perverted or only arises from the posterior lobe is not essential to our subject, but it is interesting to note that Blair Bell (13) who has done considerable work, both experimental and clinical, on the pituitary, believes that the active chromophile cells of the anterior lobe show no great difference from the cells of the pars intermedia (which he characterizes as *proinfundibulum*) and that the secretion acquires its pressor principle after it enters the pars nervosa. The substance so secreted is believed to affect the cortical cellular metabolism and produce a state of stability. It is most likely oxidative in nature. Victor Horsley has shown experimentally that the cortex in dogs deprived of their pituitary glands was far more sensitive to electrical stimulation. It would not be amiss to mention the intimate relationship existing between the superior cervical ganglion by way of the internal carotid and the pituitary. It is most illuminating when one considers its interrelationship with the chromaffine system and throws considerable light in the production of the epilepsies induced supposedly by the adrenals. I have in mind particularly the experimental work of Benedek (14), Schaller (15), and others, and the clinical interpretations of Tracy (15). They point out the altered cortical cellular metabolism due to an altered or diminished pituitary secretion, which in turn enters into the production of epileptic states.

Tucker (26) found that of two hundred cases of epilepsy, 31.5 per cent. revealed some evidence of pituitary implication, and of these, excluding all other diseases, fourteen per cent. showed pure pituitary types. Munsen (16) found at the Craig Colony that the gland was somewhat smaller in size and weighed less, as compared to the normal. Uncinate attacks due to temporosphenoidal irritation have been mentioned by Cushing (17). The following case is predominantly pituitary in origin.

CASE I.—E. G., five and a half years old, female, an exceedingly bright child, had attacks of both petit and grande mal. The first attack came at the age of four, while the child was at a summer resort. It was stated that she fell to the ground. A year later another attack occurred, and thereafter they came every four or five weeks. Later they occurred twice a week. The past history of the child revealed nothing referable to birth, development or past illness. There was a history of fainting spells in the father's sister.

Examination showed a child somewhat short for her age. The head showed some frontal bulging. The teeth were small and in a bad condition. A distinct Sergent's white line was elicited. I thought there was a slight weakness in the right upper and lower extremity. Aside from this nothing was found neurologically. Her optic discs were somewhat hyperemic. The exhibition of luminal and small doses of thyroid apparently increased the attacks. An x ray of the skull revealed a somewhat enlarged sella, and in addition an irregular floor. Whole gland of pituitary was given with benefit. Her attacks stopped, her appetite returned, she became stronger and less sleepy, and the Sergent's line became feebler. This child undoubtedly had an

adenomatous enlargement. Whether the first fall had anything to do with it, one cannot tell, although Tucker (26) speaks of these cases as giving an early history of a fall. The Sergent's line revealing the hypoadrenia shows the exhaustion of the pressor principle of the pituitary, which then called on the adrenals for aid, with the latter becoming finally exhausted. The faulty metabolism in shown in the sleepy state, lack of vigor and loss of appetite. This may also have been due to other glands indirectly affected.

THYROID.

This gland deals more directly with cellular metabolism than any other gland of internal secretion. A lack of function leads to sluggishness throughout the body. This is visible in the subcutaneous infiltration of the skin and the intestinal walls, leading to constipation, and the autointoxication and a decreased alkalinity of the body in the epilepsies, as pointed out by Prior and Jones. In fact one of the striking clinical symptoms to contend with in epilepsy is the constant constipation.

Epilepsy has been long associated with athyroidal states as myxedema, cretinoid idiocy and simple goitres. Hertoghe (18) and Levi and Rothchild (19) have repeatedly shown the association of epilepsy with thyroid disturbance. Thyroid has been used empirically for a long time in the treatment of epilepsy with beneficial results. Falta (20), Gowers (6), Claude and Schmergeld (21), and Prior and Jones have established the association of the thyroid and epilepsy. Gowers found enlarged thyroids, particularly in females in the first half of life; often associated with exophthalmos and a rapid pulse. Claude and Schmergeld found both areas of sclerosis and hypertrophy in the gland. Prior and Jones found both active glands and quiescent ones in epilepsy. The mechanism in the thyrotoxic type is caused indirectly through the sympathetic adrenopituitary cycle, thus showing that epilepsy is not a disease entity, but a symptomatic disease.

The following case is of interest because of a probable thyroparathyroid implication and the association with eclampsia.

CASE II.—F. S., female, aged twenty-five, married. Her only pregnancy resulted in the birth of a seven and a half months' child. This was preceded by a convulsive fit. The patient states that she has had kidney trouble since this period. I once witnessed part of one of her attacks. Her pupils were dilated and did not react to light. Her knee jerks were exaggerated, but there was no clonus or Babinski present. After the attack amnesia and mental confusion with headache were present.

Examination showed a dark complexioned, short young woman, with hirsuties on both legs and chest. The teeth were poor, and a hard sclerosed mass was found in the neck, occupying the right lobe of the thyroid. It was the size of a pigeon's egg. The blood pressure was 130/75. The urine showed albumin and hyaline casts. She complained of feeling cold constantly, especially cold hands and feet. She complained that her hair had been falling out. Under dietetic treatment and parathyroid extract her attacks diminished. Her urine still showed some albumin and a few hyaline casts. She was later

given thyroid extract, her albumin decreased, her hair stopped falling out, the diet was increased to include nitrogenous foods, and her epileptic attacks ceased.

This case is of interest in that the relationship of nephritis to parathyroidectomy and its effect on these glands was pointed out by Massaglia (22). The symptoms point to a thyroid, parathyroid dyscrasia. The falling hair, nephritis, vasomotor disturbance, poor teeth and her probable eclampsia at seven and a half months and finally her epileptic attacks improving under the above treatment makes this appear to be a thyroid parathyroid involvement. The right lobe of the thyroid and both parathyroids were probably involved.

Prior and Jones (11) report three cases of epilepsy in their series that showed benefit under parathyroid therapy.

THYMUS.

The following two cases of epilepsy showed both major and minor attacks which could be classed under the status thymicolymphatic type. The patients showed marked improvement following the exhibition of glands containing the pressor principle (pituitary and adrenal). These are the cases that approach the thymico, pituitary, adrenal type of Timme (23). They also come under the hypoplastic type of cases (status thymicolymphaticus of Bartels). They are distinctly vagotonic and bear out the endocrinous metabolic origin of epilepsy (the vegetative system acting as the intermediary), more so than any of the others. Here we find a small cardiovascular apparatus and other conditions showing the physical inadequacy of these patients. Douglas Symmers (24) found on autopsy that many cases of status lymphaticus were epileptics and advised incidentally x ray therapy applied to the thymus to counteract lymphoid tissue proliferation.

CASE III.—A. B., fifteen and a half years old, male high school student, had major and minor epileptic attacks for the past four years. He was born by a low forceps delivery. In early childhood he perspired profusely and was continually subject to colds. At six years of age he had an attack of asthma. Onanism was admitted, being practised once a week.

Examination: Eyes reacted to light and convergence, no extraocular disturbance, the fundi were negative. The color fields of both eyes were contracted particularly to green; the right eye showed a greater contraction to red than the left. The knee jerks, ankle jerks, and abdominal reflexes were present and normal. A suprapatellar reflex was elicited. No ankle clonus or Babinski was present. An intense Sergent's white line was present. His musculature was well developed. The arms were long, reaching within six inches of his patella. A female distribution of pubic hair was present. The pulse was 62, blood pressure 104/54.

Laboratory findings: Blood examination—Red blood cells, 3,900,000; hemoglobin, 80 per cent.; color index, one; leucocytes, 8,400; polynuclear neutrophiles, 54 per cent.; lymphocytes, 30 per cent.; large mononuclear lymphocytes, 9 per cent.;

eosinophiles, 7 per cent.; basophiles, 0; abnormal forms, 0.

Blood chemistry: Blood sugar, 0.095 per cent.; carbon dioxide, 58 per cent. per volume; coagulation time, 7 minutes 40 seconds; blood Wassermann negative; x ray of skull showed abnormally thickened and clubbed posterior clinoids.

Treatment: The patient was placed under anterior pituitary lobe fresh gland treatment, but with no apparent benefit. Thyroid feeding gave him some benefit. However, the posterior pituitary, or, rather, the whole gland which includes the posterior pituitary plus a small amount of the whole adrenal gland, gave the best results. His attacks gradually diminished in severity until he only had a mild attack of petit mal once a week.

Three members of his family were endocrinopathic. The father was the red checked, beardless type, who showed a female suprapubic hair distribution and no hair in the axilla. A further questioning revealed minor qualities of a vagotonic individual. The mother was only four feet six inches in height, with a large trunk and short lower extremities. She weighed 162 pounds. She had headaches accompanied by vomiting. Her mother (the boy's grandmother) also suffered from headaches. The grandfather died from asthma at sixty. The grandparents were both short in stature. The patient's mother stated that she commenced to gain weight rapidly after her marriage and that her hair fell out periodically. Examination showed that her pupils reacted to light and accommodation and that there was a slight internal strabismus of both eyes. Hirsuties was present on her upper lip, her hands were pudgy and her eyebrows thin, especially at the outer third.

A brother aged nine was fifty-four inches in height and had a bilateral arm length of fifty-three inches. Mouth: His lateral incisors were less than half the size of his central incisors and the palate was highly arched. His eyebrows showed no hair or very fine lanugo. He had a dolichocephalic head. Sergeant's white line was present.

SUMMARY.

This boy had an endocrinopathic ancestry from both sides, the father a status type and the mother and grandparents dyspituitary in type. His infantile history showed him to be a vagotonic individual, i. e., the profuse sweatings and asthma at six. At present he showed anthropoid arms, a Sergeant's white line, low blood pressure, high lymphocyte count, and an eosinophilia of seven per cent., all pointing to a status type plus vagotonia. When last seen he had an occasional attack of petit mal.

CASE IV.—The following case referred to me also showed a status thymicolymphaticus type plus vagotonia. The attacks began with convulsions at the age of two. He had one attack every three or four weeks for a few months and then they ceased. His present attacks began at the age of fourteen, and at fifteen he had several more attacks. They then became more frequent, often occurring twice daily during the past two years. The type of the attack showed them to be regular major attacks.

Examination: The eyes were normal, except the right fundus which showed a slight temporal pallor.

Otherwise his neurological examination was negative. He revealed anthropoid arms, female distribution of hair over the pubis, no hair on face or in the axilla. A Sergeant's white line was present, but not marked. The blood pressure was 110/72 and the pulse 70. An x ray of the skull showed the sella to be somewhat deeper on the interior part of the floor. His posterior clinoids were indistinct. The epiphysis and diaphysis were separated in the radius. He was placed on anterior pituitary together with thyroid with excellent results. His physician and also his brother, who have observed him, state that he is a different boy now. He takes an active interest in boyish sports, is much stronger, does not tire easily, is much brighter and has lost the constipation from which he suffered for many years. When last heard from, he had had no attacks for several months, and was feeling well.

GONADAL TYPE.

The following case showed the implication of the genital glands in the production of epilepsy. This is a case of eunuchoidism:

CASE V.—J. H., male, aged thirty-five, married, no children. The family history showed that both parents were tall, as well as his brothers and sisters. His chief complaint was headache for the past four years, mostly of a bitemporal nature, and increasing in severity. He volunteered the information that his eyesight was becoming more dim. He had several attacks, the last one on November 7, 1920, of which he still showed evidence on his forehead, the result of his last fall.

Examination showed him to be six feet two inches in height. He had a smooth skin of female texture, a microcephalic head, a face of mongolian type, with large prominent malar bones, eyes almond shaped, hair scant on pubis and of female distribution, no hair in the axilla and little on the face. His penis was the size of a twelve year old child's, and the testis the size of a bean. His breasts were enlarged. His pupils reacted to light and accommodation. There was no ocular muscle disturbance. Slight weakness of the right side of the face; upper jaw slightly prognathous; mouth showed a highly arched palate; uvula and tongue in median line; teeth of upper jaw overlapping the lower ones considerably. The central incisors were prominent, but the lateral incisors were not smaller. The right lateral incisor was canine in shape. The lower incisors were smaller. Reflexes of the right upper extremity were increased as well as the right knee and ankle jerk. An abortive Babinski, but a positive Oppenheim was present on the right side. An x ray of the skull showed the bones to be thickened. A pineal shadow was present. An area of rarefaction was visible in the frontal bone. The sella was somewhat larger than normal, the floor slightly irregular, and it was entirely bridged over by the clinoids. This patient was placed upon pituitary with excellent results. He is entirely free from his headaches and attacks of epilepsy.

That the interference with the gonadal secretion can produce epilepsy is an old conception, particularly when the menses in the female cease. Prior and Jones (11) found fibroses of the ovaries, together with atrophy of the interstitial cells. They

found that out of forty epileptics only three showed regular menstruation. Ashe reports that three cases under his care with ovarian dyscrinism, having epilepsy, were cured either by feeding ovarian gland or by injection of the extract of this gland.

That this patient (Case V) showed an enlarged pituitary is evident, and it was due to the atrophy of his testes. That the removal of the testes leads to enlargement of the hypophyses was first shown by Fichera (22) in 1906, in his experimental work on animals. He diminished its size by injecting testicular extract. It is also interesting that Abt (22) and Schüller (22) ascribes mongolism to the absence of this gland. This patient showed some traits of this character. He also showed evidence of a pyramidal tract lesion.

CONCLUSIONS.

From what has been shown in this paper it is evident that the endocrines are the dominant factors in the production of the epilepsies.

The vegetative nervous system is the intermediary between the glands and the biochemistry of the cells of the body. In the treatment of the epilepsies, Jacobi, and particularly Oppenheim, had great faith in atropine as a therapeutic measure when the bromides failed them.

Let us hope that the future will throw still further light upon the relationship of the endocrines to this affliction, so that mankind will be more fully capable of combating every case that arises, or, better, by judicious therapy prevent its occurrence.

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The Endocrines in Everyday Practice*

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You are probably not aware of the fact that therapeutic nihilism has grown to such an extent that many of our most prominent medical schools are now giving the treatment of disease by drugs but scant attention. The fundamental cause of this attitude is but a normal result of the incompatibility of therapeutics with the trend of modern knowledge. Most remedies are used empirically today as they were fifty years ago; most textbooks of practice continue to refer to a remedy or a combination of drugs as serviceable or useful or as having been found efficacious by so-and-so, etc. Excepting perhaps in the case of our few specifics, no attempt is made to explain the mode of action of a given drug upon the pathological process it is intended to antagonize. This does not mean, in keeping with the

therapeutic nihilist's belief, that therapeutics does not subserve a very useful purpose; far from it. It does mean, however, that its practice being out of harmony with scientific progress in all other branches of medical knowledge, it is being dropped by the wayside as a relic of charlatanism, a haphazard—though sincere—attempt to relieve or cure, in which precision plays but little if any part. Professor Lewellys F. Barker over two decades ago stated that "pharmacotherapy was moribund." Its increasing elimination from medical schools suggests that its interment has begun.

Pharmacology, meaning by the term the experimental study of the action of drugs, does not seem to be extricating therapeutics from its downward course. Although practitioners are in part to blame for this owing to the acquired habit of using drugs empirically, it is a question whether willingness to

*Lecture delivered by invitation before the Bucks County Medical Society, at Bristol, Pa., May 18, 1921.

avail themselves of the pharmacological work published would aid them seriously in establishing their treatment of disease on a more scientific footing. Two reasons, among many which could be adduced, tend to sustain this conclusion: 1, the experimental work is done almost exclusively in *normal* animals, and thus conveys but a vague idea of the effects of the drug being studied in disease; 2, experiments in normal animals obviously entail, through the absence of a morbid process, the exclusion of the kind of study which the practitioner most needs: that bearing upon the *cure* of disease. Briefly, while pharmacologists and biochemists contribute much to our knowledge and our pharmaceutical armamentarium, we miss in their work the very soul of our aims: a knowledge of the manner in which remedies antagonize disease and defeat its death-dealing effects.

Hence the fact that we possess so few specifics. Frank Billings in his Presidential Address at the 1903 meeting of the American Medical Association, declared that "drugs with the exception of quinine in malaria and mercury in syphilis, are valueless as cures." The fact that but two agents have been added to the list during the eighteen years that have elapsed since this declaration was made, arsphenamine and emetine, indicates how despairingly limited are the actual contributions to our curative efficiency. Were it not for the wonderful strides of preventive medicine since the immortal Pasteur opened the portals of the bacteriological field to the world of research, we would have but little cause for happiness in our professional labors.

Yet, it would be quite unfair to incriminate only the unsatisfactory condition of therapeutics on this score; pathology, even as it now stands, is quite as invalid when the relations of cause to effect are scrutinized. Indeed, as Professor Barker also stated in the previously quoted estimate: "drugs of unknown physiological action cannot conscientiously be set to act upon bodily tissues in disease in which we are ignorant of the deviations from the normal." The static pathology of Virchow does not aid materially the determination of morbid processes that occur during life. As Magendie (1) wrote as far back as 1837, "the truly scientific mode of studying medicine lies almost wholly in investigating the manner in which morbid changes are produced." He rightly considered the pathological lesions as "consequences of the disease, the anatomical proofs that it has existed," but in no wise the morbid process itself.

With so dismal a picture of those features of practice which warrant our existence as practitioners and the trust the public reposes in us, you may deem the situation a hopeless one, in view of the seeming futility of the enormous aggregate of work contributed by a multitude of observers during what might be called the scientific era of medicine which began about seventy years ago. Precisely the opposite is the case. Indeed, from my viewpoint, we have in this aggregate of facts a veritable gold mine in which nuggets galore are at our disposal. It is for us practitioners to garner, analyze and synthesize what sound data this aggregate from all branches of medicine, collateral and clinical, contains; it is for us to carry on, so to say, an intellectual refining process calculated to establish both pathogenesis and therapeutics on a rational footing and eliminate em-

piricism once for all. It is the result in outline of an effort in this direction which, I may say, has been uppermost in my mind during the better part of my working life, that I will now submit to you.

Twenty-three centuries ago, Hippocrates wrote (2): "It is to the efforts of Nature that the attentive and able physician looks for guidance." Today the most virile trend of modern thought, that of immunity, which underlies the whole field of preventive medicine, is a practical expression of the principle first enunciated by the father of medicine. Why should we not likewise make it the underlying principle of pathogenesis and therapeutics? From my viewpoint, this is precisely what the endocrines enable us to do.

To make this clear, however, it is necessary to review briefly two of the ductless glands which are now known to take part in these processes: the adrenals and the thyroid.

THE ADRENALS.

Beginning with the adrenals, located as you know over the kidneys, there is apparently considerable confusion concerning the nature of their functions. In fact, there appears to be as many of these as there are physiologists who have devoted much time to the subject. For many years, the prevailing belief was that, as observed by Oliver and Schäfer in 1894, the purpose of the secretion of the adrenals was to sustain the tone of the cardiovascular system, and that as a therapeutic agent it would raise the blood pressure. But other physiologists found that far from raising the blood pressure, adrenalin, particularly in small doses, lowered it. We were also told that the adrenal secretion possessed antitoxic properties, but physiological experiments were advanced to show that it did not. Even Cannon's well known emergency theory in which fright and excitement are considered as a cause of increased activity of the adrenals has been attacked. It is obvious that physiology thus interpreted would hardly aid the clinician in elucidating any disease, general or local.

And yet all these seemingly antagonistic functions are entitled to a legitimate place, provided that they be considered as but expressions or manifestations of a *fundamental* function first submitted by myself as long ago as 1903.

Some of you may recall that at that time I attributed to the adrenals an all important function: that of endowing the hemoglobin with the power to take up oxygen in the pulmonary air cells and of converting it into oxyhemoglobin. The adrenals thus became the governing organs, as far as oxygenation was concerned, of metabolism throughout the entire body. This conception—even though it upset the philosophy of respiration which had endured almost since the time of Lavoisier and Priestley in the eighteenth century, not only met a need long emphasized by many European physiologists—that a secretion capable of clutching, so to say, the oxygen from the alveolar air, was a *sine qua non* of the respiratory function—but it also fulfilled every condition of that function. Thus, the adrenal product or adrenin was found to increase the oxygen intake and the carbon dioxide output; to increase both the depth and rate of respiration, also the heat production, temperature, etc. It has been contended that the

adrenals did not secrete enough to meet the needs of so important a function, but as shown by Stewart and Rogoff (3), the spontaneous liberation of adrenal secretion was 0.0003 to 0.001 gm. per kilo of animal—thus making 30 to 100 c.c. in the twenty-four hours—ample enough to meet the needs of the function. Other observers have confirmed the connection of the adrenal secretion with hemoglobin, also the fact that venous blood under proper osmotic conditions could be converted into arterial blood by the addition of the adrenal principle.

If we now apply this function to the different rôles attributed to the adrenals by various physiologists, its harmonizing influence becomes striking. The variations of blood pressure were simply due to the different rates of oxygenation and metabolism produced indirectly in the muscular coats of the arteries by the different doses of adrenalin. Thus *large doses* caused general vasoconstriction and a general rise of blood pressure by acting upon the entire cardiovascular muscular structure, while *small or minute doses* caused the opposite or low blood pressure by causing constriction of the smallest arteries of all, the vasa vasorum, which supply the vascular walls, and the first effect is owing to their diminutive cavity. The arterial blood entering the arteries being diminished, their muscular coats relaxed, causing passive dilatation and low pressure.

Turning to the practical side of the question, we will now find that the same fundamental functions governed in part by the adrenals: oxygenation, metabolism and blood pressure, show variations corresponding with the secretory efficiency of the adrenals, or the size of the dose of suprarenal gland or adrenalin administered. In *Addison's disease*, for instance, the salient symptoms are low arterial pressure, low temperature and myasthenia—all indicating slowed metabolism. Now we know that these are precisely the symptoms we improve or even counteract in this disease by administering suprarenal gland. But that does not mean that we can cure such cases simply by giving this substance, for it serves only to compensate for the failure of the gland due to a local morbid process: usually fibrocaseous tuberculosis. We *do* get good results, however, by treating the latter simultaneously with iodine or the iodides.

Another example of failure of the adrenals, with its attending deficient oxygenation, metabolism and blood pressure, is afforded by *Asiatic cholera*. In 1903, I urged that the symptoms of this dread disease, the hypothermia, frigidity, cyanosis, profound asthenia, rapid intermittent pulse, high rectal temperature, low vascular tension, etc., corresponded precisely with complete adrenal failure. The epidemics in Europe, particularly during the Balkan and World Wars, have proved this to be true, various clinicians having found that adrenalin in large and frequently repeated doses not only antagonized the effects of the cholera toxin, but soon removed the typical symptoms of adrenal failure. The *choleraic diarrhea* of soldiers following great fatigue was also found to be promptly arrested by injections of adrenalin, the primary cause of the disorder being exhaustion of the adrenals and virtual arrest of their secretory activity.

This same exhaustion you have all witnessed many times, doubtless, towards the close of many infectious diseases, *typhoid fever*, *pneumonia*, *influenza*, *scarlet fever*, *measles*, and other disorders. The adrenals, pushed to their utmost to sustain the *defensive fever*, which of course includes unusually active oxygenation, finally give out. As these organs sustain, we have seen, not only the vascular tension but also the contractile power of the heart muscle, heart failure threatens in addition to the other symptoms of adrenal failure. The majority of the patients who die from exhaustion would be saved if the importance of the adrenals were generally realized and adrenalin in eight minim doses were injected intramuscularly—never hypodermically—with a syringe of saline solution several times a day. I have seen cases virtually snatched from the jaws of death by this practice.

Old age is another cause of adrenal failure, the glands steadily decreasing in functional activity after middle age. *Senile pneumonia* does not correspond symptomatically with the lobar pneumonia observed in younger subjects, but presents all the signs of adrenal failure. After a brief reaction to the infection, there is practically no fever, no pain in the chest, but little cough or expectoration. Then follow a rapid fall of arterial tension, rapid pulmonary edema and exhaustion. To treat such cases in the same manner as the pneumonia of young people is to hasten death. They need stimulation from the start and particularly the intramuscular injections mentioned above of small doses of adrenalin in saline solution. The mortality from pneumonia is far from decreasing; it will never decrease until the rôle of the ductless glands in its pathogenesis is recognized.

Care should be taken, however, never to use adrenalin when, during the presence of fever and high tension, the adrenals are already overactive. Thus, injections of adrenalin are recommended by some surgeons to prevent heart failure in *anesthesia* but condemned by others owing to the many deaths it has caused. These deaths are due to the fact that the physiological action of adrenalin is disregarded. It should not be given early because the anesthetic itself, as well as the excitement and fright from which many patients suffer, stimulate the adrenals, the blood thus containing an excess of adrenal secretion. A dose of adrenalin added at this time becomes toxic; it so constricts the peripheral or terminal arterioles that the vascular tension is greatly and suddenly raised and the heart is arrested by the back pressure of the blood column. It should only be used, therefore, when heart failure threatens late in the course of the anesthesia, or in febrile disorders when the heart failure occurs as a result of adrenal exhaustion.

The same principle applies in the *disorders of the heart* itself. Adrenal gland is a remarkable aid where atony of the heart muscle exists, precisely where digitalis is indicated, that is to say, in uncomplicated dilatation, defensive compensation in valvular disorders with asthenia, hypotension, hypothermia and other disorders. An important feature in this connection is that when digitalis itself begins to fail, it is often due to exhaustion not only of the adrenals whose secretion sustain directly the heart muscle, but also to the fact that the sympathetic sys-

tem depends upon this same adrenal secretion to carry on its function. I have seen adrenalin save life in auricular fibrillation where digitalis had lost its hold. In threatening cases, adrenalin intramuscularly, with one sixth grain in a triturate under the tongue, is promptly effective. I have seen elderly people dying gradually from uncomplicated heart failure, with low blood pressure and almost imperceptible pulse and heart sounds (a natural outcome of the progressive atrophy of the adrenals which begins after middle age) virtually come to life and resume their normal occupations under the combined use of suprarenal gland and digitalis. The suprarenal substance here, supplied not only to the adrenal medulla its specific adrenal principle, but in doing so it also provided the whole cardiovascular system and the sympathetic system and its ganglia their normal *pabulum vitæ*, i. e., the substance which caused in them the resumption of normal oxygenation and metabolism.

The dozen or so of diseases briefly outlined merely serve to illustrate the important rôle the adrenals must play both in pathogenesis and treatment. It becomes a question as to the actual number of morbid processes or diseases influenced directly or indirectly by the adrenals. This question may be briefly answered by another: How many diseases are there in which oxygenation and metabolism are more or less factors of the morbid process? Close analysis of the question would show that the list includes practically all diseases which threaten life itself, the entire field of neurology and psychiatry—indeed, probably the whole domain of morbidity.

Again, the illustrative diseases described are only those in which adrenal organotherapy is indicated. How about other agents and, particularly, drugs? This is where precision is again introduced where random treatment now prevails, *for with familiar remedies we can control the functional activity of the adrenals or its effects*. Thus, the adrenals are directly stimulated by strychnine. This fact, which I first urged in 1903 and several times since (4), has recently been confirmed by Stewart and Rogoff (5) who found in the course of an elaborate pharmacological study, that therapeutic doses of strychnine, those you use every day, caused a marked and lasting increase in the production of the adrenal secretion. Now, any textbook of neurology will show by the number of diseases neurologists treat with strychnine: functional atonic disorders of all kinds, *paralyses, myasthenias, neurasthenias, shock, chronic alcoholism, cerebral anemias, depressive insanities*, and others, what the adrenals mean in these diseases. Yet, if any of these disorders happens to be one in which the adrenals are deficient, which means that the whole sympathetic system is likewise incapable, owing to deficiency of its chromaffin or medullary-adrenal substance, to carry on its functions, neurologists meet failure, since strychnine serves merely to stimulate adrenals incapable of supplying enough secretion to benefit the patient. If, however, they supply also the needs of the adrenals themselves and simultaneously those of the sympathetic system by administering suprarenal gland, or its more active and persistent counterpart, hypophysis sicca, they will obtain the desired result.

But strychnine is not the only agent which stim-

ulates the adrenals. Either directly or indirectly, nux vomica, brucine, cocaine and other cardiac and nerve tonics do likewise. So do caffeine, tea, nicotine and alcohol. Experiments and the recent war have emphasized this action of alcohol and confirmed the older observations of Hobart A. Hare that it enhanced the defensive functions of the body when administered in moderate doses and well diluted. Moreover, the value of alcohol in moderation and free dilution has been recently emphasized experimentally. It was found that it is in antagonizing fatigue wastes that alcohol is especially effective. This is again in keeping with one of the earliest discoveries concerning the functions of the adrenals, that of Abelous and Langlois, who found that the antitoxic properties of these organs were primarily the destruction of fatigue wastes. Conversely, the prolonged use of strong solutions of alcohol, such as brandy or whiskey, have been found to cause degenerative lesions in all ductless glands examined, including the adrenals, and to lower the efficiency of the defensive functions. Light beers and wines, however, were found quite harmless to these organs, owing to their inability to produce intoxication even in large doses.

I might remark in this connection that temperate laws based on knowledge, instead of the prevailing product of misguided altruism often fed, unfortunately, by ignorance and fanaticism, would soon command the respect of the American people. It is because all adrenal stimulants, by increasing oxygenation and metabolism, convey a feeling of well being, particularly during fatigue or exhaustion, that they are in such demand, especially by working men. It is not the innocent and temperate who should be prohibited but the intemperate.

Continuing the pharmacological side of the question, how can we counteract excessive functional activity of the adrenals? We have seen, for instance, that adrenalin injected early during anesthesia is dangerous and has caused several deaths because the dose is added to an excess of adrenal secretion and that constriction of all arterioles finally leads to cardiac arrest. Should we in a threatened case of this sort inject, as is now done, strychnine, caffeine, alcohol, and other drugs, which, we have seen, would further stimulate the adrenals? Obviously not. We have precise antagonists in the nitrites. As Sollmann (6) states: "The fall of blood pressure is due entirely to the extensive vasodilatation produced by the direct action of the nitrite on the arterioles." Injections of nitroglycerine, inhalations of amyl nitrite, are therefore indicated, all stimulants being avoided. Arsenic, chloral, and other hypnotics, alcohol in large doses, bromides, veratrum viride and other depressants, also include in their pharmacological action, depression of the adrenals.

THE THYROID

We will now turn to the only other endocrine considered today, the thyroid gland. Physiologists and clinicians are in accord concerning the influence of this gland upon metabolism. Kendall, to whom we owe thyroxin, by far the most perfect of the thyroid active principles yet produced, states in this connection (7): "The changes occurring in a patient with thyroid deficiency, or in an experimental animal by

the administration of thyroid, are so great that practically every cell within the animal organism is changed. The effects are felt throughout the nervous system and the circulatory system, the rate of metabolism is enormously increased, and even the skin and hair show revolutionary changes."

When referring to the influence of the adrenal secretion or organic products on metabolism, I used this term only to avoid confusion. In reality the adrenals affect but one phase of metabolism, the constructive phase as it were, that of anabolism. The thyroid gland also influences metabolism, but its catabolic, or breaking down, phase. This accounts for the familiar antifat effects when thyroid is administered. This action on reserve fats is followed by breaking down of the nitrogenous tissues themselves. When, as is well known, the thyroid is functionally inadequate, metabolism is slowed, as it is in adrenal insufficiency, but the symptoms are specific to the thyroid. In the severe forms there occurs a condition in which the oxygen intake and carbon dioxide output are so reduced that the subjects have been termed living plants. Even in such cases of cretinism, thyroid gland sometimes produces marvellous effects, veritable resurrections.

In a general practice, such cases are seldom seen. Many are encountered, however, in which the thyroid is not quite sufficiently active functionally to carry on metabolism, or rather catabolism, perfectly. These patients with *hypothyroidism* are often fat and pudgy. They belong to what might be called the torpid and morbid class—languid, constantly fatigued, somnolent on rising—all of which symptoms tend to disappear as the day wears on. They sometimes complain of headache and backache, usually between the shoulder blades, or of the sacrolumbar pains which rest in bed tends more to aggravate than to improve. Their temperature is low, and their hands are flabby, cold and sometimes damp, as are likely to be the feet, the latter being occasionally of the type termed flatfoot, and requiring central support. The skin is sallow, pale and waxy, causing the patient to appear older than his or her age, and suggesting an underlying renal trouble. Alopecia, beginning at the forehead and tending towards the occiput, is common in adults, the hair in marked cases being coarse, dry and brittle. The eyebrows tend to become shortened at the expense of the outer ends. Marked cases may also show cutaneous infiltration as in myxedema, and, perhaps, an increase of weight and even pads of fat over the clavicles. The teeth tend to become carious and loose and are particularly prone to become tartrous, with pyorrhea alveolaris as the general result.

Such patients are particularly prone to nasopharyngeal infections with aural complications through the eustachian tubes. This is due to the lowered germicidal activity of the vault where the defensive barriers are of the utmost importance owing to the constant inhalation of bacteria laden air. Why this vulnerability to infection?

A most unfortunate feature, in view of the incalculable harm it does, is the neglect in this country of the rôle of the thyroparathyroid apparatus in the immune chemistry of the body, now fully recognized particularly on the continent of Europe. It is not only a function which may be utilized to treat suc-

cessfully many obscure disorders, but one which when abnormally active, as in hyperthyroidism and dementia præcox, may cause great suffering, insanity and death.

Although Horsley, in 1892, showed that the rôle of the thyroid in catabolism included the breaking down of toxic waste products of metabolism, the theory that the thyroparathyroid mechanism took part in our defensive functions against infections and exogenous pathogenic agents was introduced by myself in 1903 and further developed in 1907. I then urged that it played the rôle of the sensitizing agent described originally by Denis and Leclef and which Wright and Douglas termed opsonin. This has been confirmed at the Pasteur Institute, the Bacteriological Institute of Liège, also in Russia and Italy. McCarrison (8), to whose labors we owe much in this connection, states in a review of the question, beginning with my labors: "The fact that the antitoxic and bactericidal resources of the body are largely dependent on the functional perfection of the thyroparathyroid mechanism is, I believe, as clearly established as is the influence of this mechanism on metabolism." His excellent book upon the thyroid gland fully confirms this conclusion.

In certain cases the development of any disorder is likely to prove rebellious to treatment and the use of small doses of thyroid gland will more or less promptly turn the tide. In *articular rheumatism* for instance we often obtain no results from the salicylates, even in large doses, but if we study such a case from the viewpoint of endocrinology, we will discern symptoms of hypothyroidism of the larval type: a tendency to cold extremities, a pasty skin with perhaps transient edemas, scant hair, obesity, eczema, psoriasis, nausea, myasthenia, etc. Now, if we give these patients say one and one half grains of thyroid daily in divided doses, we will soon find the salicylates effective. Why? Because the thyroid product sensitizes the bacteria produced by the causative focal area, tonsillar, dental, intestinal, etc., and they are at once taken up by phagocytes and broken down by the antibodies in the blood. The germs are not seized and destroyed until the thyroid hormone sensitizes them.

In *pulmonary tuberculosis*, thyroid administered to experimentally infected animals has been found not only to raise markedly the opsonic index, but also to prolong greatly their life and in some to prevent death. The blood had been found amply supplied with antibodies, complement, agglutinin, precipitin, etc., but it was only when the thyroid was administered that the animals began to improve following infection, because this hormone was necessary to render the germs vulnerable to the antibodies. The great lesson to learn from this fact is that we have been doing the right thing for years for these patients, but doing it half heartedly or too late to save them. Iodine—which alone has stood the test of time—owes its action to the fact that it is taken up by the thyroid. Another lesson is that we need no longer wait until a patient becomes tuberculous to know that he is predisposed to this disease, since all cases of larval hypothyroidism, the symptoms of which have already been described, are known to be exceedingly vulnerable, while practically all pretuberculous people show signs of hypo-

thyroidism. Preventive treatment by the iodides would do much, therefore, to reduce the mortality of pulmonary tuberculosis.

The number of diseases influenced by the thyroid gland owing to its influence on catabolism and its sensitizing action on bacteria and other harmful substances which are to be engulfed by phagocytes or other defensive agencies, and reduced to end products to be eliminated from the body, is familiar to you all. Briefly, it is the long list, including *syphilis*, *bronchial asthma*, *arteriosclerosis*, *glandular enlargements*, *osseous tuberculosis*, *psoriasis*, and other diseases, in which you have been administering iodine, especially in the form of iodide of potassium. It is in truth the thyroid hormone which does the work and when you administer iodine in any form, the gland takes up about eight and five tenths per cent. (Marine) of that administered, until the quantity it can assimilate has been reached. This event marks the beginning of the so-called physiological effects, which are not such in the least, but an effort to eliminate in every direction possible the offending and useless excess of halogen that may be present in the body at large.

We have now seen that while deficient thyroid efficiency, hypothyroidism, predisposes to infection and may even prevent the action of our remedies, increased efficiency of this gland, obtained by administering iodine or the iodides, increases defensive efficiency in many diseases. There are two other phases of the functions of this gland in disease to which a brief allusion must be made: compensatory enlargement and excessive defensive functional activity.

Compensatory enlargement is occasionally witnessed in various infections including pulmonary tuberculosis and also in toxemias, even what might be termed a physiological toxemia such as is produced by the excess of wastes during pregnancy. In both forms of intoxication, the thyroid increases in size, because it is inherently unable to undertake and carry on more than its usual antitoxic functions, the catabolism of physiological wastes. When, however, any abnormal source of intoxication occurs, a general infection, a focal accumulation of bacteria which are constantly excreting toxins, whether located in the tonsils, sinuses, teeth, gums, and other places, or in the intestinal canal as fecal stasis, or the water or food contains toxic substances, the gland tries to increase its functional activity and enlarges.

This condition, when persistent, is that familiar to you all as *goitre*. When due to an acute infection, it promptly disappears when the causative disease is spent. When, however, the source of infection or toxemia persists, as is the case when a focal infection or an external source of continuous, even though slight, poisoning occurs, it is this causative factor which must be removed. Simultaneously, however, the thyroid itself must be aided by the use of iodine or of the iodides and iodine ointments, weak enough not to irritate the skin and prevent absorption, applied over the growth. A third feature of *goitre* requires attention, however: the abnormal dilatation of the vessels in the gland—which is the mechanical cause of its excessive activity, as long ago shown by Claude Bernard. While, but *only* while, its efficiency is being compensated by the io-

ides, this abnormal vasodilatation, which causes the enlargement, can be mastered by another familiar remedy, ergotin, which causes contraction of the vessels. With these four measures carried out simultaneously: removal of the primary cause, daily applications of weak iodine ointment over the gland, and iodine or the iodides and ergotin internally, I have seen uncomplicated *goitres* disappear often with surprising rapidity.

The same process of compensative enlargement and enhanced activity may become such as to cause very serious and even fatal diseases. We have a striking example of this action in exophthalmic *goitre*, in which the tissues are, so to say, driven to self destruction through excessive sensitization and catabolism. Here, again, some focal infection or toxemia is the underlying cause, the gland becoming enlarged because it is unable normally to stand the strain and, as in ordinary *goitre*, undergoes arterial congestion to increase its efficiency. Important, however, in this connection, is the fact that in many instances the gland does not become enlarged because it is efficient and able to carry on the antitoxic strain placed upon it. Nor is exophthalmos present in all by any means. Yet, the typical tachycardia, tremor, and other signs are present—all typical of exaggerated metabolism. Here, again, removal of the source of toxemia, focal, endogenous or exogenous, absolute rest to reduce to a minimum the production of wastes which increase the defensive activity of the organ, ergotin to constrict its arteries, further aided in this disease by another powerful vasoconstrictor, quinine hydrobromide, and a diet from which dark meats, known to excite the thyroid, are eschewed, will enable you, if persisted in, to master the disease without sacrificing the gland itself or any part of it.

The last disorder to which I will briefly refer is one which has sent hundreds of thousands of children and adolescents to our insane asylums and is increasingly doing so—*dementia præcox*. That this means their practical death is suggested by the fact that in New York State alone, out of 21,070 cases in its asylums, less than one case per thousand had been discharged cured during the fiscal year ending June 20, 1917. Now there is much evidence to show that we are dealing with a disorder akin in some of the catatonic cases at least, to a condition resembling exophthalmic *goitre* in the sense that (at least from my viewpoint), the phosphorized fats which form part of the cerebral and other neurons, break down under the influence of excessive thyroid activity, induced by a toxemia, in predisposed subjects. Here again, removal of the cause, some focal infection and reduction of the thyroidal exuberance, by constricting the dilated vessels, supplemented by lecithins—organic products rich in phosphorus and a diet rich in fats, to rebuild the affected neurons, has produced recovery where the intensity of the symptoms had left no hope.

CONCLUSIONS.

In closing this elementary outline of a few of the many disorders which might be analyzed to illustrate the close relationship between the endocrines and everyday diseases, permit me to urge that I am not submitting theoretical considerations, but repeat-

edly proved facts, which you can readily verify yourselves in your daily work. I would also urge: 1, that although some thirty and odd morbid processes have been summarized in this paper, the relations between cause and effect, meaning thereby the manner in which the morbid changes were produced, found their normal explanation in every instance, and 2, that in not a single instance was a remedy advocated empirically, that is to say, without indicating how it antagonized the morbid process for which it was recommended. The endocrines alone made this possible.

On the whole, what I have submitted seems to me to sustain my firm belief that *there is a rational medicine in sight, as regards both pathogenesis and therapeutics*, provided we utilize intelligently the splendid aggregate of knowledge all the branches of medicine, auxiliary and clinical, have placed at our disposal. If we do this, and with Hippocrates "look

to the efforts of Nature for guidance" and realize that we have in the endocrines the mechanism through which Nature not only sustains the vital processes but also preserves their integrity, the days of empiricism will soon be numbered.

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Endocrine Tropisms

Gonadotropism: Fourth Contribution

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The importance of clinical endocrine studies becomes daily more apparent, and every specialty in medicine is beginning to note the benefit derived from linking endocrinology with a great number of subjective as well as objective manifestations. Even traumatism has an endocrine significance as was ably shown by Crile in his numerous and interesting contributions on this subject. It is fairly well established today that the entire human sensory motor mechanism is intimately linked with the functions of the glands with internal secretions. These secretions certainly possess a determining power in directing the functional trend of the individual, and if permitted to pursue an unchecked career will very often produce physical manifestations which will furnish interesting data for the histologists. In the majority of instances an equilibrium is maintained which need not force the individual to seek medical advice; on the other hand, many *formes frustes* as well as prodromal endocrinopathic states are not recognized until histopathological changes have become permanently established. Recognized early, such occurrences should become rarer as we advance in endocrine lore and interpretation. In this communication an interpretation of the endocrine phenomena which occur in the gonadotropic individual will be dealt with and will include chiefly the functional and subjective manifestations, interspersed here and there with histopathological confirmation of endocrine findings which are still in need of such support, but in the main the paper will deal with subjective complaints such as the physician is called upon to relieve in the majority of instances. Sundry therapeutic precepts will be offered which may not tally with the orthodox opinions, but they will be given only when the procedure adduced proved of signal and lasting benefit.

It is almost an axiom that the preservation of the race depends upon the functional activity of the gonads, and if the ego is to survive in the form of another individual it is only insured of a future existence through the activity of the reproductive organs. Hereditary characteristics and the varied nuances of character, predisposition and personality, in fact the entire makeup of the soma and psyche are embodied in and are transmitted through the medium of the spermatozoa. They carry with them dominant and recessive qualities from the male element consisting of sidechains gathered from every cell depot of the individual and also from every gland with an internal secretion. The female elements contribute their quota in a similar manner and the union of the two reciprocally complement each other in that the male recessive feature is dominated by the corresponding dominant female equivalent and vice versa.

The somatic and psychic factors which would be required to furnish the materials to make a complete male or female are not known, and the *sum-mum bonum* still remains a comparative term—for we know not where perfection exists and what is best for mankind, present or future. In so far as the physician is concerned it is his domain to prevent disease or an uncomfortable existence and to cure a given sufferer totally, rapidly and with the least inconvenience to the patient. At least that is what the sick one hopes for and what the doctor ought to strive for. To me it is not only a pleasure but a distinct duty to inform the reader of this communication of the less common somatic and psychic indices which would shed a ray of light on the interpretation of an apparently obscure case as well as to outline a therapeutic procedure based upon results obtained from its employment in more

or less analogous situations. To begin with, I make the statement that there are no men or women without heterosexual psychic or somatic appanages; I say this no matter how perfect their architecture or functions may be. Similar to the bipolarity of a magnet, every human being is likewise bisexual. In the study of gonadotropisms the quantitative determination of the heterosexual contents will have to be ascertained before any therapeutic advice is given. This is only possible with an adequate knowledge of endocrine principles and facts and the ability to collate apparently dissimilar findings. On the surface, endocrinology may appear iconoclastic, but a deeper investigation convinces one that it is a distinct step forward towards determinism in medicine and in many instances when properly used renders prognostication almost prophetic.

As you may know, there are signs which enable the doctor to determine beforehand whether a child will contract diphtheria or not. These signs have been made use of before the Schick test became a public school procedure, of course by endocrinologists only. To them dark hair implanted low on the forehead, sharp canine teeth, darkly pigmented moles, a tendency toward hirsuties or a white Sergeant's line were the indices of an adrenotropic constitution. To them also an adrenotropic child was considered far more susceptible to diphtheria than a child otherwise constituted, such as a thyrotropic, pituitotropic or gonadotropic one. This communication being concerned with gonadotropic occurrences takes cognizance of the gonadotropic importance of mumps in a child or adult, and possessing such information the doctor can predict the psychosomatic limitations in such an individual which may take place in the future. What these limitations, abnormal traits or pathological tendencies will be one cannot and ought not attempt to predict, but that they will come about can be stated with emphasis.

If it were possible to ascertain the infancy of the well known psychopaths I am fairly certain that Oscar Wilde, Zacher-Mazoch or Harry Thaw would give a history of mumps during their early life. It must be remembered that only in rare instances are the gonads affected by an inflammatory reaction as a complication of mumps; much more frequently, however, they are involved in a manner most cryptic and give evidence only later in life that their functional mechanism was peculiarly interfered with. Histologically, one rarely finds anything deviating from the average. In such instances the psychopathic soil is inherited and all it needs is the seed of environment and a flaw in the gonadal chain which takes in the functions of the adrenals and the pituitary in its manifold manifestations. But it takes a Daniel in endocrinology to interpret the Tekel Upharsin written on the exterior of the individual and which when corrected early would keep an Oscar Wilde out of a jail and perhaps a Thaw also. But one must be able to read and correct. Volumes have been written concerning endocrinology and the communication I am offering herewith is only an A B C. We shall return to mumps and consider this disease as a gonadotropic index. Whether the gonads were involved, resulting in an

orchitis or oophoritis, does not matter, nor does it follow that a severe inflammatory complication during an attack of mumps need cripple the functional expression of the gonadal apparatus.

The most insignificant attack with an ineffectual recovery is often observed in those dangerous and extrasocial psychopaths whose parents hardly remember the slight swelling which occurred during the early period of the patient's life. Evidently mumps must fall upon a soil hereditarily below par in order to produce a disturbance in the cerebro-adrenal relationship as a result of this invasion by a gonadotropic poison. Embryologically the cerebral cortex, the adrenal cortex and the endocrine cells of the gonads are interrelated. Functionally the thyroid, the pituitary and the pineal gland play a rôle in the functional activities of the gonads and in order to work correctly the gonads require the healthy support of these endocrines and only when this perfect orchestration is at hand can we speak of a *mens sano in corpore sano*.

Now then, how is one to determine the balance of power among the endocrines? What have we at our disposal to determine the tropism of this or that individual, be he a patient or not? The answer is simple: Anamnesis and status præsens. But as simple as the answer appears at first sight it is nevertheless a difficult one to follow and though as laconic as the basis of all religions, "Love thy neighbor as thyself," it is rarely adhered to. One must be generous in spending as much time as possible in order to unearth from the past the underlying cause of the trouble and to delve deeply into the diseases of infancy, advent of puberty, home life and other environmental conditions of the patient.

With this in view, I shall give a few guiding suggestions, fully cognizant of the fact that I can only offer the A B C of the topic under discussion. In view of the fact that mumps have a tendency to involve the gonads I have designated this malady as gonadotropic. Diphtheria is for potent reasons adrenotropic. Having obtained a history of mumps in your patient it is endocrinologically correct to suspect an error in the gonads functionally and at times even structurally. The patients need not divulge anything directly relative to their gonads or *vita sexualis*, and often it so happens that we must be more than discreet in approaching the subject, but the demeanor of the patient will disclose a certain degree of secretiveness as though their innermost secret is about to be placed under a microscope, thus revealing unconsciously the stumbling block which causes them to seek medical advice. We need not expect a story centred about the functional activities of the gonads. The patient will complain of a headache, more often than not supraorbital in location, again it may be on the vertex, at the occiput, or anywhere on the head, but possessing a certain periodicity in its occurrence, loss of appetite, epileptiform attacks lacking the stamp of genuineness and a host of symptoms which belong to the vast domain of psychopathology.

The next feature in the anamnesis is a most important one and deals with thoroughness with the gonadal advent, this being a particularly important period in the life of the female. Here it is the height of neglect to ascertain superficially the men-

strual functions as is often done by the busy practitioner, but an insight into the pituitary function must be obtained by a study of the periodicity, the adrenals are surveyed by a study of the pains and the thyroid shows its effect by the state of the menstrual blood. There are other questions rarely put to the patient, but which nevertheless have a telltale significance in an endocrine investigation, such as, "Where does the premenstrual blemish appear?" and strange to say some rather clever gynecologists confess that they never heard about it. "Can the napkins be easily washed?" If a leucorrhea is present it is very important to ascertain its most intimate characteristics. "Is there a distinct change in the appetite at that time and does the patient crave for sharp foods?" All these questions have a bearing upon the correct interpretation of the trouble, and furthermore possess valuable therapeutic information. Having mentioned the premenstrual blemish, I believe a few words concerning its peculiarities will not be amiss. I found it present in ninety-five per cent. of women, the rest not being certain about its appearance anywhere on the body. It appears from two to ten days before the flow is established and lasts from one to three days after. At times it disappears as soon as the menses appear. Its place of occurrence is of importance to endocrinologists as a deviation from the common location is frequently associated with frank or masked gynecological disease. In the great majority of healthy women in whom healthy gonads can be assumed to exist the blemish appears at the nasolabial furrow on the right side in the form of a small pustule at times no larger than a pin head. A gonadal error is not present if it should occur on the corresponding left side. Should it develop on the forehead, shoulders, back or chest, I would on this basis not consider the gonads as absolutely functionally intact. Appearing on the chin, it has likewise no special significance. I have by no means exhausted the manifestations appearing during this impregnation preparatory period, and I am quite certain that there will be students of endocrinology who will finish what I consider only a beginning. Dark rings under the eyes, an enlargement of the thyroid, a thickened condition of the lips and irritability will all be considered of importance in their exaggerated or attenuated appearance. Aside from the menstrual flow and its varied expression, one must not lose sight of the environment during its first appearance.

I have pointed out elsewhere it is of the greatest moment to prepare the mind of the child for this advent and make its initiation the most natural and least shocking accompaniment of womanhood. A shock in certain girls during this first gonadal crisis, for it certainly is a crisis, will bear its undesirable fruit in the future in the form of a psychic or endocrine derangement. It is therefore of prime importance to ascertain whether any shock was given to budding womanhood at that time and fully weigh the environment of the child, its health at that time, the familial status, economic reverses, curtailment of customary luxuries, studies, work, and other factors. From an endocrine point of view this may be summarized as the menstrual anamnesis.

A gonadal crisis occurs in boys also, and though

devoid of its objective innovation in the form of a flow of blood, it nevertheless has its subjective equivalents and one must be prepared to remove the secretive reserve with which the youth or young adult tries to surround his psychic *vita sexualis*. For him there are also terrors in store for which he cannot find an explanation and broods silently in a corner, or becomes absentminded, forgets his lessons, cannot concentrate, and the shock is delivered when he fails to pass his school examination and is thoroughly punished by an ignorant parent. The climax which breaks down the psyche of the boy and sows the seed for a future psychopath is not infrequently consummated in the doctor's office when the youth is bluntly confronted by the crippling results following masturbation, and henceforward the susceptible psychogonadal mechanism tries to find an excuse for its existence and an outlet for its expression. Both become unnatural and twisted and furnish the material out of which the future delinquent, the ne'er do well, and the outspoken criminal are made. For such we have many wise and unwise remedies, but, in my opinion, prevention and proper home hygiene and careful and sane preparation would relieve legislators, lawyers and judges of much unpleasant work. To go into the subject still more deeply is to purloin the domain of psychoanalysis, a much needed department of medicine in that it makes thorough history taking a part of its armamentarium.

From the examination of the patient we have still greater endocrinological support in ascertaining the tropism of the individual. Here as in the anamnestic part features are left out by the busy practitioner which are considered good information by the endocrinologists. It has not become common property that the teeth have been given an endocrine importance by myself in an exposition of the subject under the title of *An Endocrine Interpretation of the Dental Apparatus*, which appeared in *Endocrinology* for April, 1917. This has been emphasized before. Since then a few careful observers have supported my contention and I shall here give a short résumé of the teeth in gonadotropic individuals.

In the gonadotropic individual the dental apparatus carries a very striking earmark of the tropism. It is well known that the middle upper incisors carry a message from the pituitary and that the canine teeth designate the individual's adrenal equipment. The upper lateral incisors do the identical function so far as the gonads are concerned and furnish an earmark, though an unexplainable one, of the somatic and functional completeness of the gonads. Why this is so I do not know, but on many occasions the poor implantation of the left upper lateral incisor, together with a careful reexamination of the patient physically and anamnestically proved that the patient had an ovarian disturbance instead of the suspected appendicular trouble. If, *ab ovo*, the gonads are the individual's points of least resistance in so far as trauma is concerned, they will show on the surface and in the patient's upper lateral incisors the stamp of teratological or functional defect. As may be gathered from the tooth involved in a right ovarian situation the relationship is a crossed one in that the left

upper lateral incisor is involved. The aberration from normal consists in a poor implantation, its mesial edge showing forward and at times even overlapping the middle incisor. One must be careful in differentiating the real torsion from the apparently twisted tooth having no gonadal significance and resulting from a too small upper jaw, the condition being one of crowding, and hence without a gonadal endocrine expression. A similar twisted state in the right upper lateral incisor points to the left gonad.

A few years ago I had occasion to visit my Alma Mater hospital and related my endocrine experiences; the house physician at that time suggested that I be given an opportunity to prove my findings. They had a number of patients brought into the room, among whom was one who had a congenitally absent testicle, the other being normal. I proceeded to examine the teeth of the eight men and by elimination one was left in the room as the most likely one. You can imagine the surprise of the doctors when I picked the right one among the eight. An almost similar occurrence took place when I accompanied a doctor on his rounds in one of the big hospitals in this city. A woman who had a diseased ovary removed was shown to me and I was asked by the doctor to determine, in an endocrine way, which one was absent. The correct answer puzzled the doctor until I imparted to him the method of analysis. Now, I determined the side on which the ovary was removed, not by changes that took place since its removal, but from an analysis of the teeth, which imparted to me the information that one ovary must have been deficient and hence the likely one to be affected by a disease process requiring surgical interference. In case of the absent testicle I also determined from an analysis of the dental apparatus which one was delinquent. In the case of a near relative I took the stand against the opinion of one of the most noted surgeons in the land in that I considered the condition not one of surgical appendicitis but rather that of an ovarian neuralgia. The same individual had more than six attacks, the last one appearing nine years ago. She is perfectly well today, and I am certain that there are many others who had the same trouble but were operated upon for lack of information of the kind used to save my relative from the knife. The relationship as mentioned before is a crossed one, the left upper lateral incisor indicating a functional or structural abnormality in the right gonad, the right one pointing vice versa.

Such individuals, when they give a history of mumps, furnish enough data to the discerning physician to keep him on the lookout for gonadal situations, psychic or somatic. Now comes another instance forever fixing the significance of the gonadal teeth in my mind. A woman of forty-five came to the hospital for pains in the abdomen and left side. She had never menstruated, was married many years, was never pregnant. When I examined her mouth the striking feature was the entire absence of both upper lateral incisors. Upon questioning her about them I was told that they never erupted. I made a tentative prognosis of congenital absence or primitive development of her gonads. By a careful gynecological examination the adnexa

were not palpable and a rudimentary uterus was found. Since then the utility of this sign has been established, at least in so far as I am concerned.

The reader will gather from what has been said that any individual possessing marked heterosexual stigmata carries this excess at the expense of his own psychosomatic gonadal storehouse. Hence it is to be taken as significant of diminished masculinity if a man has to shave only once a week, has a squeaky voice, shows a gynecomastia, pubic hair with the apex downward, venus dimples over the sacrum, lack of hair on the shins, and an eye suggestive of exophthalmos. If the case is that of a woman who presents a hairy upper lip, or undeveloped breasts, or hairy shins, or a masculine distribution of the pubic hair (apex upward) she likewise does so at the expense of her psychosomatic femininity. The man and the woman of these types suffer. If they do not complain of any discomfort at the time, they nevertheless possess certain characteristics in their demeanor sufficient to draw the attention of the critical observer. Their gonadal equipment is incomplete and often their complaints which have been classified as sexual neurasthenia, for the sake of convenience, have received only superficial attention and if anything only makeshift therapy.

In the records of my friend and teacher, the late Dr. Joseph Fraenkel, will be found the case of a man who proved to be a nuisance to himself and others and a particular pest to the doctors whom he consulted, who was completely cured, much to the surprise of the man himself and his previous physicians, by a vigorous therapy with ovarian extract. He received other endocrines before but only the latter had an effect upon him. Cases can be multiplied but would introduce repetitions, and there are by no means instances lacking where women showed their only improvement after a suitable therapy with sperminum Poehl by mouth or injection.

For me to go into the hopeless domain of incurable teratological defects, such as is shown by the gonadal expression in cases of adiposogenital dystrophy or cases of gigantism would be a waste of time. Whether it is best to operate upon their pituitary in the absence of serious intracranial symptoms or not I leave to the surgeons. To my mind surgery will not untie the Gordian knot of their endocrine tangle. However, it is in our power to alleviate their subjective discomfort by proper endocrine therapy, bearing in mind their gonadotropism. For the endocrine therapist, however, there is a vast field for doing wonderful work with those chronic headaches, pseudoepilepsies, sexual abnormalities and other conditions which show the tropisms described as gonadal in these pages. You will find the headache associated with the menstrual phenomena, that they have a certain periodicity, that they are supraorbital and occur in those who show one or more of the gonadotropic signs spoken of before. In the pseudoepileptic there will be an absence of tongue biting, no injuries, the patient will not display the abject hopelessness in his facial expression which invariably stigmatizes the incurable epileptic, and there will be some sort of a hitch in his psychic or somatic *vita sexualis*.

Only half of the good will have been accom-

plished if we do not warn the patient against a too hasty oophorectomy, forgetting that much good can be obtained from a judicious endocrine therapy and also that every pain in the appendical region need not require the knife and that this pain may come entirely from a faulty ovarian function. Here an endocrine interpretation will be of great benefit and save the patient from an unnecessary operation.

Now as to the use of the various endocrine products: Let me warn the beginner against all advertised products. Let me warn him particularly against the readymade diagnosis and the readymade shotgun pill. He who indulges in such therapeutics will learn nothing about endocrinology and will frequently do more harm than good. There are a great many manufacturing concerns who dry, rub and extract part of various quadrupeds and sell them to the unsuspecting medical public as endocrine products. Deal with long established reliable firms. Shun the business seeking firms who deluge your office weekly with literature which is less than useless in practical instances.

Now as to the drugs themselves. Let me inform the doctor that there are few instances where the firm gives due consideration to the endocrine status of the animal used for the furnishing of the particular gland desired. For instance, one will not deny the fact, unless he is totally ignorant of endocrine interrelationship, that an animal whose gonads are diseased cannot furnish a good gonadal extract, testicular or ovarian. Not only are the gonadal extracts useless from such an animal but the pituitary gland of such a beast also suffers and at the expense of its endocrine constitution. Such a pituitary extract may have certain biological standards equal to the healthy and unchanged gland, but endocrinally it certainly cannot be as potent as the healthy animal's pituitary.

The crux in the manufacture of pituitary extract is had when we have to admit that our extracts are made chiefly from structures obtained from castrated bulls or steers. Such pituitary extracts, at best, do not come up to the requirements of discerning endocrinologists. Let us hope that this defect will be removed when endocrine therapy will play a rôle equivalent to its possibilities. Another drawback is the method of killing steers for the obtaining of suprarenal glands. Not only is the gland functionally altered as a result of its unbridled existence devoid of its gonadal check, but the steer is brought into contact with all the horrors so graphically portrayed by Crile when it views a row of slaughtered animals hanging with heads down and throats cut and gushing blood. His adrenal apparatus is profoundly affected, resulting in a desire to escape or to fight. Not infrequently such a scared animal runs loose in an abattoir making things lively for the slaughterhouse attendants. During this brief period the adrenals of the steer receive numerous demands for more adrenalin which must be sent into the blood stream in order to supply the muscles with defensive powers. The demand is continually increased even while the animal is being hoisted up and even while his throat is being cut and even for a few minutes after that. From this steer the adrenals are removed in a much depleted

state and from such glands the manufacturers make their extracts. This is the story of the adrenals obtained from animals killed by the kosher method. The preliminary stunning of the steers such as is used in the west is much more desirable in that it eliminates to a marked degree agony adrenalin. Of course the blood pressure raising principle is present in all adrenals, but there are factors other than pure blood pressure raising which are of importance to endocrinologists, and it stands to reason that during the brief period of time that the animal is subjected to such selfevident shocks that his adrenal equipment must suffer and that an extract made from such material is by no means the greatest desideratum.

Another endocrine product is ovarian extract and corpus luteum. The latter is and properly should be obtained from healthy pregnant cows. I have my suspicions about healthy cows being slaughtered, but until we obtain proper standardization of endocrine products by the government we will have to be satisfied with makeshifts. Mammary extracts are made from glands obtained from nonpregnant animals. There are very many purely technical considerations to be disposed of, but they are of no direct interest to the therapist.

Nor is the subject of endocrines exhausted without a word of advice as to administration. The chronic habit, and it is nothing but a habit, to prescribe drugs, with the exception of castor oil, to be taken three times a day, is a farce and entirely devoid of true therapeutic principles. If one dose accomplishes the desired effect there is no necessity to repeat it; if it is necessary to repeat it I do not see the advantage of giving it only three times a day. Why not every hour if we are anxious to obtain a therapeutic expression of its capabilities in a particular train of symptoms?

With endocrine products one has to deal carefully, and this is the reason why I am so much against the readymade diagnosis and the accompanying suggestion of the manufacturer who takes upon his shoulders the onus of the expert and tells the doctor to give this in *petit mal* or that in ovarian neuralgia, or in a dozen other conditions. If one cannot work out his own therapeutic salvation the manufacturer of drugs with hit or miss tactics will never help you.

In prescribing thyroid extract begin with small doses only, less than a quarter grain, for many unforeseen unpleasantnesses may arise when a beginner uses this drug. There are instances when one may give as much as thirty grains a day, but before doing this one must be absolutely certain that it will do no good in smaller doses. Suprarenal extract by mouth may be given from one sixth up to one grain at a dose, repeated as often as is necessary, even up to a dose every half hour. Ovarian extract must be used in larger doses, say one grain every one or two hours as the case may be. Of mammary extract I have given as much as 120 grains a day for a week and obtained my result in removing the depression in a girl of fifteen, whom I consider a beginning dementia præcox. I do not state that a cure occurred in this instance, but only wish to bring out the size of the dose and its effect,

at least in this instance. As yet we have found no cure for this disease, even with the endocrine drugs.

Pituitary extract gave me a great deal of satisfaction in a few cases of epileptiform attacks and I used it rather sparingly, giving one quarter grain every other day and watching the outcome. It removed in a few instances the tongue biting, in others the duration and severity, and in all the great prostration and temporary lethargy that follows the convulsions. For certain headaches pituitary extract is of invaluable utility, but it must be given with caution. In gonadotropic states, physiological or pathological (gonadoadvent or gonadopause) this extract is frequently the only drug which will remove the great host of inconveniences from which the patient comes for relief. In the psychogonadal

syndromes one will have to use seriatim, pituitary, gonadal extracts or suprarenal gland extract. The latter will occasionally do wonders, and in a short time. A combination of adrenal and gonadal extract was of transient and temporary use in a few cases of dementia præcox, but its effects upon this disease cannot by any means be considered as even approaching a cure. Lack of space prevents me from going deeply into the finer therapeutic technicalities, and I shall consider this communication as having done its bit of good if the doctor will use his own diagnosis and try for himself, beginning with small doses at infrequent intervals the many single endocrine drugs (not using combinations at all), and establish the utility of animal gland extracts for himself.

8 WEST EIGHTY-SIXTH STREET.

A Study of High Blood Pressure in Women from the Endocrine Point of View*

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This communication is a protest against the use of the designation essential hypertension as applied to cases where high blood pressure exists without the presence of any discoverable pathological lesion. The term essential, employed in this connection, has never been clearly defined, and, like much other medical phraseology, merely serves as a cloak to lack of precise knowledge. In place of this vague term, I should like to offer another which seems to be more exact, and founded upon a sound physiological basis.

The condition of high blood pressure is far too grave a one to be dealt with lightly. The reckless use of the term essential is inexcusable. In the series observed by me, no case was permitted to be designated as essential until the most rigid investigation had ruled out every possible cause for the condition. In each instance the Wassermann test and its modification were made; careful analysis of the blood did away with the possibility of nitrogen retention or the beginning of nephritis; a diligent search was pursued for any evidence of arterial, cardiorenal or luetic affection. The chest was röntgenographed in a search for aortic disease, and the condition of the teeth, the tonsils, the appendix, the gallbladder, the uterus, adnexa, rectum and every other organ which might by any possibility harbor infection, or under any circumstances give rise to arterial hypertension, was minutely scrutinized. Only when all these efforts had failed to produce any causative factor to account for the high blood pressure was it deemed proper to call a case essential.

Failing to find a reasonable pathological basis for the condition in certain cases led the author to seek for an endocrinological explanation. A careful study

of the features and constitutional markings of the women who registered a high blood pressure without pathological evidence to which the condition might be ascribed, soon revealed them to be of the pituitotropic type. From long continued clinical observations, the author, in common with other endocrinologists, has learned to classify different individuals in accordance with their exhibited characteristics, basing the different classifications upon the external somatic markings and functional expressions.

ENDOCRINE TYPES.

The principles upon which the classification into types is founded have already been described (1), together with the influence of the endocrines upon constitutional development. The influence which the inherited forces of these glands of internal secretion are able to exert is intense, even in the earliest period of life. By means of it the individual is molded into that form which is characteristic of his ancestors, nationality and race; it determines all the features of his body, all those traits of character and idiosyncrasies which have something in common with those of his progenitors. A certain endocrine may take a leading part in this construction of the individual, exercising an all comprehensive influence, which results in the creation of an individual peculiar to that endocrine type, so that such an individual may represent a pure type and can be named after the particular endocrine responsible for his physical structure. Thus, a pituitotrope is one whose development was governed by the hypophysis; with the thyrotrope the thyroid was the chief molding influence. The type produced by the influence of one gland is strikingly different from that produced by some other gland,

*From the Medical Clinic, Brooklyn Diagnostic Institute.

so that beings having a common glandular origin can be readily segregated into a particular class. To the endocrinologist these different types are so distinct that he is able to differentiate them as readily as he would differentiate the breed of an animal or species of a plant.

Not so readily classified, however, are those people whose development has been influenced by the joint action of two or more glands, usually designated as mixed types. Where several glands have had a share in the molding of an individual, their action may have been coincident, or have occurred at different chronological periods. In these mixed type individuals some features will have one glandular origin, and some another, so that at times it requires a great deal of skill to decipher these different indications, and establish the correct constitutional classification of that individual. Being much more complicated in their features, their functional expressions and predispositions, they are by no means as readily classified as those of the pure or single endocrine type.

Bearing in mind that human characteristics are the result of endocrine activities, and that each gland has its allotted share in human development, also that any one of these glands is able to have a predominating influence, wider than that of any other gland, it is easy to understand that the status and functioning of the organs of any particular individual depend upon the state of the controlling glands. If, through disease or otherwise, an endocrine system becomes deranged, the organs under its control, whether in the first stages of development or later in life, will exhibit somatic or functional evidences of the altered condition of the particular endocrine involved. Disturbances in an endocrine are accompanied by definite organic alterations, pathological, functional or psychical. The progressive pathological involvement of a gland may lead to the most astonishing changes, transforming an individual to an extent which may make him unrecognizable. He may alter in stature, in bodily contour or complexion, the shape of the hands and feet may change, the proportions of these extremities, the quantity and distribution of the hair, and, in addition, there is frequently a change in the mentality, habits, character, attitude, disposition, and other psychic qualifications of the individual.

There is a definite relationship between glandular affections and the nature of the symptoms produced in the organs controlled. Definite disturbances in the glands of internal secretion result in definite changes in certain organs, no others being affected. The thyroid, for example, however, altered functionally or anatomically, acting upon certain particular organs, produces phenomena which constitute a syndrome characteristic of its peculiar disturbances. The hypophysis, if affected in a similar manner, displays its condition through other channels. It selects another chain of organs and creates a syndrome different from that brought about by the diseased thyroid. No other gland, when affected in the same manner, can produce a symptomatology resembling that of either the thyroid or the pituitary.

If we compare the symptomatology of two known disturbances of the endocrines, their striking

difference and peculiarities become apparent. Analyzing the symptoms of Basedow's disease, which is the result of a disturbance of the thyroid, and comparing them with those of acromegaly, a hyperfunction of the pituitary, we will soon be convinced that the organs involved in the first case are of an entirely different type from the other, and also that the nature of the involvement is wholly dissimilar. In Basedow's disease, the cardiac, vascular, nervous and cutaneous systems exhibit thyroïdal disturbance; in acromegaly, the osseous, autonomous, sexual, acral and gastrointestinal systems carry the pituitary burden. The organs involved in the two conditions have nothing in common, nor is there any resemblance in the symptomatology induced or originating in them. Without mentioning the symptoms of these two conditions, which are generally familiar, it is certain that anyone having knowledge of them cannot fail to assent to this statement. The variance in the two symptomatology is due to the different systems and organs controlled by individual endocrines, each one displaying its condition through the organs it controls in a manner peculiar to itself, either directly by its excretions or hormones, or indirectly through the influence of these hormones upon the nervous system. Hence the symptomatology will differ according to the gland which is involved and the nature of that involvement.

PITUITOTROPIC CHARACTERISTICS.

In view of the pituitary tropism of the women manifesting arterial hypertension, it seems necessary to touch upon at least some of the most prominent characteristics of this type. The pituitary is endowed with numerous highly specialized and powerful forces. Some of these are in control of somatic features, others of functional. The somatic controls determine the volume and form of most of the bodily organs (the nose, glabella, malar prominences, superciliary ridges, maxillæ, lips, tongue, extremities, and viscera). Thus, such anatomical peculiarities as the height and general bulk of the body, the size and shape of all acral parts, the form and position of the teeth, the structure of the nasooropharynx, are controlled by the pituitary. Pituitotropic individuals invariably present some peculiarity of any or all the organs mentioned above; one individual may exhibit only a few markings, such as a fleshy nose, a receding lower jaw, or spaced teeth, while another may present hypertrophied tonsils, lengthened extremities and voluminous sinuses. Both, however, upon close investigation, will be found to possess a sufficient number of structural and functional features to identify them as of pituitary makeup. No similar peculiarities are even encountered in persons of other endocrinological type.

The following are the most prominent functional controls of the pituitary: the periodicity mechanism which assigns the time when the teeth are to erupt, puberty to begin, and menstrual cycles to occur, which marks the period of pregnancy, the onset of labor, and the occurrence of menopause; or limits of time of sleep and its awakening. Also such phenomena as the ocular (strabismus, enophthalmos, exophthalmos, hemianopsia), the cardiac (bradycardia, arrhythmia), urinary (pollakiuria, polyuria, dysuria, glycosuria, enuresis nocturna), gastro-

intestinal (spasticity, atonicity, ptosis, dyschlorydria), and other important functions are under pituitary domination.

TROPISM OF ESSENTIAL HYPERTENSION.

During the past few years I have been able to conclude, from the observations made in the study of women of the essential hypertension type, that they were all in reality pituitotropic individuals. They exhibit many of the features enumerated above. Their physiognomy, in most instances, is so typically pituitotropic that it necessitated but little effort to determine their type. On the other hand, in another numerically greater series of cases where the high blood pressure of the patients was found to be associated with definite pathological lesions (renal disease, cardiac affection, arteriosclerosis, infection, uric acidosis, etc.), the features and endocrine markings were not pituitary but those identified with other glandular types. In those cases (cholecystitis, pelvic disease) there was a preponderance of thyroidal markings; in others who suffered cardiorenal complications, the adrenal markings appeared to be predominating.

Riesman (2) in a recent article called attention to a class of hypertension cases observed by him in females. He noted the following characteristics: First, the women were of short stature and greatly exceeded their average normal weights; second, they had passed through multiple pregnancies; third, they were free from high tension causing diseases; fourth, they were at the menopausal age or over; fifth, they were inclined to constipation and similar gastrointestinal disturbances; sixth, they presented evidences of left sided cardiac enlargement without arterial, renal or retinal pathological changes.

A study of Riesman's cases, even from the meagre description offered, leads to the conclusion that they also were pituitotropic. The description he gives—obesity, shortness of stature, multiparity, constipation, and menopausal age—suggest pituitary involvement. He does not associate these with the constitutional habitus of the patients, but merely mentions them as observed characteristics, and offers in explanation of the hypertension incidents in the life of the patient, such as worries associated with household cares, special trials and tribulations of the soul, brought about by multiple gestations, deliveries, and the caring for many children; also physical and mental strain incidental to the menopausal period and other similar events. While I am in full accord with his observations with reference to the type, I do not accept the explanations offered. The causes he mentions are insufficient to produce permanent high blood pressure. Emotions and other mental oscillations, as may be incited through multiple pregnancies, raising of children, and other factors, according to Crile, exercise a powerful influence upon blood pressure, but this is principally effected through the adrenals, and is, moreover, transitory. The change of blood pressure disappears with the termination of the provocative act and leaves no permanent effects. Emotions are more pronounced in males. It is a rare occasion when a woman suffers a ruptured bloodvessel from an acute intravascular hypertension, following violent emotion. Only in individuals of the adrenal

type, the sanguineous, erotic or apoplectic, is it common. Females of the so-called pituitary type are, as a rule, unemotional; on the contrary, they are rather tranquil and respond slowly to emotions. Hence emotions cannot be considered as fundamental in the production of permanent high blood pressure. Even Riesman does not appear to be fully satisfied with the explanations offered, and hastens to add the probability of an endocrine basis going to the extent of recalling the common association of arterial hypertension with exophthalmic goitre and acromegaly.

An analysis of the characteristics enumerated by Riesman and observed also in all of my series offers material for discussion and conclusions. Shortness of stature and obesity are hypopituitary incidents. Pituitotropic individuals of the Fröhlich type show a disposition toward shortness and bulk; those of acromegalic tendency lean toward height and slimness. In my cases all of the patients were of the short variety, while the fat distribution was of the same character as observed in dystrophia adiposogenitalis, i. e., the buttocks, hips, upper thighs, mons veneris and breasts were the storage places of fat, and not the other places which harbor the adipose tissue in myxedematous, Brissaud, Loraine, or exogenous types.

Multiple pregnancy is another interesting factor, and must also be looked upon as a pituitary feature. How hypertension is brought about by multiple pregnancies may be thus explained: The hypophysis, it must be recalled, is vitally concerned with the physiology of gestation. At the very onset it begins to hypertrophy in order to meet the extra demands to be made upon it throughout the entire period of pregnancy. It is concerned with the rhythmic uterine contractions, the period of gestation, the onset of labor, the expulsion of the fetus, the uterine involution, and many other events during this trying period of the woman's life. The hypertrophy involves mainly the anterior lobe, but does not leave the posterior and middle entirely untouched. The enlargement progresses to the hour of delivery, and is particularly marked in pituitotropic women. Indeed, they often change into miniature acromegalics with noses increased in size, lips fleshy, eyes protruding, teeth spaced and prognathic, cheek bones enlarged, voice husky, etc. After delivery the pituitary begins to lessen in volume, but the decrease never equals the former increase. After each successive pregnancy, the hypophysis remains larger and larger, so that after a number of child-births it is several times as voluminous as during the nonchildbearing period. The sella turcica in a multiparous skull may be easily distinguished by the relative depth of the fossa, the straight position of the dorsum sellæ, the small posterior clinoids, and the broad infundibular space. The hypertrophy of the pituitary during pregnancy is necessary, as it must provide for the greater hormone production demanded by the new circumstances and in preparation for the most trying event, labor, which demands an enormous amount of vital and expulsive force. But at no time can force be properly elaborated unless supported by a corresponding blood pressure, raised to the standard required in con-

formity with the demands. The rise is caused by an added supply of blood pressure raising hormone, poured into the blood stream by either the pituitary or the adrenals. In the event of pregnancy and labor it is the former which is the chief source; hence the hypertrophy. After labor the demand is discontinued, and the overproduction of hormones is stopped, but neither the hypertrophy nor the hormone production returns to the former level; both remain higher than before the terminated pregnancy. Thus with successive pregnancies the remainder accumulates, so that at menopause it amounts to a considerable figure, adding greatly to the height of the multiparous woman's blood pressure. This is the reason why many pregnancies play an important rôle in the etiology of essential hypertension in pituitotropic women.

The menopausal period constitutes another interesting feature of essential hypertension in women. The time of menopause is determined not by the ovaries alone, but also the hypophysis. An early or late menopause is established through the pituitary and not through the ovaries as commonly believed. Menstruation is not a local event, but a general one with local manifestations. If an artificial menopause is forced upon a woman in whom a double oophorectomy has been performed, all general symptoms common in her previous menstrual periods will manifest themselves every month without the presence of local molimina, because the periodicity phase of her pituitary remains intact and functioning. The same occurs also in puberty, another periodicity function of the pituitary. If this gland ripens at an earlier period than the ovaries, which either because of immaturity or disease are as yet unable to assume the task imposed upon them by puberty, the girl will menstruate vicariously in the form of epistaxis or rectal hemorrhages, or there will be other manifestations of pituitary congestion such as migraine headaches, visual disturbances, malaise and psychoses. The pituitary and ovaries, though both concerned with menstruation and menopause are nevertheless independent organs and may functionate independently for some time. In all known pituitary diseases a change in all rhythmical phenomena associated with feminine function is a common observation, irrespective of the concomitant normal state of the ovaries.

At menopause the pituitary is relieved of one of its functions, menstrual periodicity. During the menstrual life of a woman the uterus, whether pregnant or not, contracts rhythmically at specified periods. This is accomplished through the hormones of this endocrine gland, which after menopause are utilized in another direction, that of the arterial musculature. The added smooth muscle contracting hormone, in this new field of activity, is instrumental in raising intravascular pressure and tension. The author is still further encouraged in his belief by the facts obtained in several other cases, those of sterility. In these the blood pressure was high without causes to account for it; there was a pituitotropic constitution and sterility. Perhaps their pituitary hormones meant to influence the uterus were at all times active in their arteriomusculature, and, therefore, the cause of their high pressure.

PITUITARY HYPERTENSION AND ITS MECHANISM.

Granting that essential hypertension occurs in women only of the pituitotropic constitution, then what is the mechanism through which the tension is maintained at high level? This may be answered by the statement that the high tension is induced through increased production of a blood pressure raising pituitary principle, a hormone continuous in its action in behalf of an organism demanding an increased supply, and by an organ specially adapted to meet the demand.

In general, intravascular pressure is physiologically maintained by two factors: the rhythmic contractions of the heart and the peripheral arterial resistance; the other factors, the total volume of the blood, its viscosity and the elasticity of the vessel wall are of less significance. Each cardiac contraction forces an extra quantity of blood into the vascular system, adding to the volume in the already filled tubes and increasing their pressure. The peripheral resistance is sustained by the tonic contraction of arterial musculature which is stimulated for this purpose by the direct effect of the ever active endocrine hormones through the agency of the nervous supply. The two hormones known to sustain cardiac contractions and tonus are the adrenal and hypophyseal. The relationship of the former to the circulation is well known, but that of the latter is less understood. Food media introduced into the system serve only for the nutrition and rehabilitation of worn out muscle fibres, and play no part as direct stimulants of blood tension. Extractives also imbibed in food are not physiological agents and bear no relationship to permanent high blood pressure unless added continuously to the blood stream. Hence these substances cannot be looked upon as agents instrumental in the maintenance of vascular pressure.

The administration of the only isolated pituitary extract is known to be followed by an increase in blood pressure. This rise, as shown by physiology, is due to several factors: 1, the stimulating effect upon the cardiac muscle, on the contraction of the coronary vessels; 2, the stimulation of the vagus with slowing of the pulse and more forceful cardiac systoles; 3, the contraction of the peripheral vessels, especially the mesenteric; 4, the contraction of the peripheral renal vessels in contradistinction to their dilatation by adrenal secretion. All these tend to maintain intravascular tension and to increase it, if the physiological effect of the hormone is augmented. It is selfevident that an increased flow of hypophyseal secretion in the circulation, however induced, must result in an increased blood pressure, and that an endogenous hormone, originated in a living, functioning pituitary, must be more powerfully active than the exogenous, artificially prepared from animal tissue and introduced from without.

CONCLUSIONS.

No case should be designated as one of essential hypertension until every possible pathological factor has been excluded. For this reason, hidden infections of the tonsils, teeth, sinuses, appendix, gall-bladder, colon, uterus, adnexa and rectum must be sought for persistently and disclosed if present. Also such other causes as syphilis, aneurysm,

sclerosis, saturnism and similar general states causative of high tension must be excluded.

Essential hypertension in multiparous middle-aged pituitotropic women is due to an increase of blood pressure raising pituitary hormone produced by a greatly hypertrophied, hyperfunctionating hypophysis.

The pituitary hormone is a normal factor in the maintenance of arterial hypertension through its effect upon the cardiac and arterial musculature, the renal and peripheral vessels.

The term essential, in this type of cases, is inappropriate and inadequate, and should be superseded by the term hypertensiodyspituitaria, which is more rational and scientific and based upon physiological data.

Hypertensiodyspituitaria constitutes no contra-indication to surgical interference whenever this is required.

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The Endocrines as Factors in the Causation and Treatment of Dysmenorrhea*

By WILLIAM V. P. GARRETSON, M. D.,
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Having eliminated by careful gynecological examination, the usual static causes of dysmenorrhea, recourse to the routine procedures, e. g., curettage, dilatation of the cervix, antispasmodics, upbuilding tonics and other methods has long been customary. The histories of patients subjected to such treatment with no resulting benefit are legion. Many women at each menstrual period suffer as much discomfort as the average primipara during labor.

To appreciate the endocrine etiology of dysmenorrhea one must revert to a consideration of the vegetative nervous system and recall that the integrity of its functional balance is dependent upon proper hormonal balance and that there is a definite interrelationship between both as well as between all glands of internal secretion. The vegetative nervous system may schematically be likened to a finely poised balance beam resting on a pivotal support suspended from thyroid to ovary in the female or testicle in the male, the plane of the pivotal point being heightened or lowered as hyperfunction or hypofunction of these reciprocal glands may occur.

The left half of this visualized balance is the sympathetic portion of the vegetative nervous system, and the right half the autonomic or extended vagus; this schematic right and left subdivision peculiarly exists in the clinical expression of vegetative dominance in the production of right and left sided symptomatology. This is an observation of remarkable clinical interest, proved beyond all possibility of being mere chance or coincidence. By endocrine interpretation as reflected in the structural makeup of individuals, right and left sided symptomatology and pathology may be determined. It is definitely known that the sympathetic portion of the vegetative nervous system is activated and maintained in balance by adrenalin, the hormone of the suprarenals, while the autonomic portion, although not accepted generally, I believe from clinical observation is dominated by the posterior or nervous portion of the pituitary inclusive of the infundibulum. (Vagotonic effect of pituitrin on intestine and uterus.)

The vegetative nervous system has its segmental distribution in the spinal cord. Anatomical, histological, pathological and physiological proof of this now exists. All states of hypoadrenia, regardless of the etiology, lower the sympathetic tone and create a condition of vagotonia, which may be segmentally expressed as a local vagotonia or evident as a general vagotonia when all segments are affected. Hyperadrenia produces a sympathicotonia. Hypopituitarism produces a lowered vagal tone with resulting sympathicotonia, while hyperpituitarism creates a vagotonia.

At the developmental epoch in both sexes with the onset of gonadal function, stimulation through thyroid, suprarenal and pituitary by the introduction of the sex gland hormone initiates an imbalance in the vegetative nervous system and the various psychical and physical symptoms incident to this period are segmentally or generally expressed until a stabilized adjustment is effected. At this period in the young girl with inherently sluggish or deficient gonads, compensatory stress is thrown upon thyroid, suprarenal and pituitary glands. Hyperthyroidism is frequently produced to a mild degree and the enlarged thyroid at this period of life is not uncommon; likewise in hypogonadism, thyroid swelling is always present with each menstrual period. The sequel of gonadal exhaustion following too frequent pregnancies, creates a similar compensatory effort. The selective compensatory stress reaction will be expressed first through the gland which dominates the individual's physiology and this is always objectively evident in the structural type of that person. In thyroidal types, thyroid compensatory effort is dominant. In suprarenal types and pituitary types such compensation effort is primarily evident through those glands respectively. In mixed types the predominant gland is the one which responds first. In these compensatory stress reactions the gland which first responds bears the brunt of the load and is the first to be exhausted with sequential hyperactivity occurring in the associated structural determinant. Prolonged stress leads to exhaustion and thus the entire chain may slump.

*Read before the West Side Clinical Society of New York, May 12, 1921.

In the topic under discussion, namely, dysmenorrhoea, there is most generally a gonadal dysfunction and essentially always a state of vagotonia, segmentally expressed through the sacral autonomic. This vagotonic state is always due to a resulting ultimate compensatory exhaustion of thyroid, or suprarenal, or both, or a compensatory overaction of the pituitary. To determine which is the case is a relatively easy matter. Hyperthyroidal symptoms in varying degrees are now familiar to most of us. Hypoadrenia is likewise easily differentiated from hyperpituitarism.

Upon these deductions depends the therapeutic indications. The pituitary is well known as a most potent synergist to the ovary and with every menstrual period there is associated pituitary activity frequently occurring in compensation to gonadal fatigue and causing transient swelling of the pituitary to the degree of creating intracranial pressure symptoms, e. g., pituitary headache, visual disturbance from pressure on optic nerves, nausea and vomiting and either general or pelvic vagotonic symptoms, the latter being characterized dysmenorrhoea. I have seen acromegalia produced by this compensatory hyperfunction of the pituitary gland when its anterior lobe has been activated by continued effort on the part of the pituitary to aid exhausted ovaries or to compensate for their total loss by surgery.

GONADAL DYSFUNCTION.

Gonadal dysfunction or genital structural abnormality is associated with definite physical markings. Torsion of teeth, absent lateral incisors or canines are always indices of such conditions. Atrophic areas or white spots on the finger nails are always associated with gonadal dysfunctions. Abnormally large hips and lower extremities, disproportionately greater in circumference than the arms and thorax present a structural type created by ovarian dysfunction. As stated in previous papers, from simple observation one may be greatly enlightened as to

the underlying physiological disturbances which are productive of definite symptoms.

The vagotonic state produces contraction or spasm of uterine muscle, especially of the cervix. The peripheral bloodvessels in the mucous membrane (endometrium) are engorged; congestion, thickening and swelling occur, adenoids develop and the pathological picture is the same as in vagotonic states, affecting the segments controlling the mucous membrane of the upper respiratory tract.

TREATMENT.

In treatment, ovary, whole gland, is indicated when hyperpituitarism exists; the stress is thus removed from the pituitary and the high blood pressure is lowered and the vagal stimulation reduced.

When thyroid exhaustion has occurred, as it does in thyroidal types when effort is made to compensate for ovarian deficiency, administration of thyroid gland will often effect results when used alone or it may be necessary to combine it with ovary. In hyperactive thyroidal conditions, frequently seen in the early stages of thyroid overcompensation, administration of ovary will relieve the stress and allow the thyroid to return to its state of normal function.

Exhaustion states following prolonged illnesses, psychic and physical shock reactions such as create suprarenal gland exhaustion, thus causing the vagotonia due to hypoadrenia, are also frequent causes of dysmenorrhoea. In such cases the associated low blood pressure incident to the hypoadrenia indicates that both suprarenal and thyroid gland should be used to raise the lowered sympathetic and thus reduce the vagotonia. In dysmenorrhoea of this origin, the administration of ovarian gland is not indicated as the gonads are not primarily at fault. Upon the proper selection and correct analysis of cases depends the successful outcome of endocrine therapy.

11 EAST FORTY-EIGHTH STREET.

Radium and X Ray Treatment of Hyperthyroidism*

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It should be recognized that radium and x ray therapy is contraindicated in certain forms of goitre, and in these types a surgical operation is not only the right procedure, but is likewise the only way of curing the patient. X ray and radium are both useless in all forms of goitre that are atoxic and without subjective symptoms. This class may include colloid, cystic, fibrous, calcareous and osseous goitres unless they are associated with and are causing the well known symptoms of hyperthyroidism. Surgery is the best treatment for all enlarged, disfiguring, hypertrophic and simple goitres which are unsightly or produce pressure symptoms.

In young girls, about the time of the establish-

ment of the menstrual period, it is common to detect a well marked enlargement of the thyroid at times associated with rapid pulse, loss of weight and increasing nervousness. Rest, quiet life, giving up of athletic exercises and medical treatment are indicated here. If symptoms continue and if infected teeth are present they should be removed. If tonsils are enlarged, infected or have a history of past inflammation they should be x rayed or if this is impossible excised. Two or three exposures of x ray or radium over the thyroid are all that is required to cure these mild toxic cases.

CLASSIFICATION.

In order to understand more intelligently the indications for medicine, radiotherapy or surgery, it is first necessary to classify the lesions.

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The one in vogue at the Mayo Clinic may be taken as an example. Here goitres are classified as hyperplastic forty-two and eight tenths per cent., and nonhyperplastic fifty-seven and two tenths per cent. Of the hyperplastic, ninety-nine and two tenths per cent. are toxic, eight tenths per cent. atoxic.

The pathology, symptoms and especially the radium and x ray treatment of the hyperplastic toxic goitre is what this paper deals with, all other forms of goitre I consider to require strictly medical and surgical treatment.

The pathology of toxic thyroids, whether associated with cystic, fibroid, colloid or calcareous degeneration, presents in some part of the gland either an increased amount of functioning parenchyma or a deficient storing up of the gland secretion, or both. In most cases the secreting capacity of the gland is greatly increased, while the reservoir capacity of the gland is much decreased.

OVERSECRETION.

The oversecretion or too rapid elimination of an iodine compound from the thyroid which may be clinically normal in size gives rise to the symptoms we speak of as hyperthyroidism. To check the oversecretion of this iodine compound by the parenchyma of the thyroid is the object of all medical, x ray, radium and surgical procedures. Nature sometimes accomplishes this by producing a colloid or fibroid degeneration of the gland which encroaches upon and destroys the pathological quantity of the parenchyma, after which the symptoms subside.

Medical treatment does it by sedatives and rest, which decrease the nerve stimulation to the gland. It is evident that this can be accomplished only in a minority of the severe cases or where the symptoms are mild and of short duration. Surgical removal of part of the overactive gland permits the patients no time to adjust themselves to this abrupt and serious shock to the vital forces of the body, a shock that is apparent to any one who does a great amount of thyroid surgery and which can be and is readily recorded by the usual metabolism tests.

EFFECT OF X RAY.

The effect of x ray and radium on the thyroid gland is to produce a striking atrophy and shrinkage of the thyroid parenchymal cells, both on the part of the protoplasm and the nuclei, a condition which produces a marked and very apparent reduction of the secretory function of the parenchymal cells (1). Waters demonstrates the pathological picture as a perfect reproduction of a very atrophic and inactive thyroid gland, such as one sees after a spontaneously cured toxic goitre. In other words, the pathologist reports that the x ray produces a gradual and progressive atrophy of the gland cells which is analogous to and microscopically indistinguishable from a spontaneous and natural retrogression of the disease.

In a certain percentage of cases of exophthalmic goitre an enlarged thymus is present. In an original article published by me in September, 1915, I exhibited a number of microphotographs showing how easy it is to atrophy the thymus glands of rab-

bits and guineapigs, almost all the thymic tissue being replaced by the thickened trabeculae and the enormously hyperplastic capsule. For these patients the x ray offers ideal and superior results to any treatment known. I have two patients who after two and three operations each followed by a return of the tumor and recurrence of all symptoms, in one of acute mania, who are well today after six x ray treatments. Johnston, Greer, Boggs and others have reported such cases.

Since 1914 I have treated over a hundred cases of hyperthyroidism and my results average over seventy-five per cent. of the relief of all symptoms except the exophthalmos. In fifty per cent. of my patients the contour of neck became normal and the tumor disappeared.

Usually the first sign of improvement is a fall in the pulse rate followed by a gain in weight. The nervous manifestations improve, and palpitation of the heart ceases to be troublesome. The ability to work and exercise returns and to all practical purposes the patient becomes normal.

If the patient is seen and treated early in the disease the exophthalmos and other eye symptoms subside, but if the disease is of long duration there is a deposition of fat in the orbit which precludes a cure from either rest, x ray, radium or surgery.

I am firmly convinced that my percentage of cures would have been higher had I been able to select the patients, as some surgeons do, or had all cases been pure examples of hyperthyroidism. Not being an internist, and being interested only in radiotherapy, I accepted the diagnosis of the referring physicians, who were supposed to make a complete physical examination before recommending any treatment. The Goetsch and metabolism tests at this time weed out some of these borderline cases.

TECHNIC.

In undertaking the application of massive doses of x ray for hyperthyroidism as early as 1914 I was much handicapped for the want of a satisfactory technic. No articles had been written or read in America at that time, and I seriously doubt if more than two or three men were treating exophthalmic goitres with any but fractional, small doses of x ray. I was therefore necessarily compelled to originate my own technic. This of course could not be done without some mistakes which I willingly and humbly acknowledge. The mistake I made in my early cases was to hurry the treatments and use filters that were too thin. I have learned to give treatments at intervals of three and four weeks instead of ten days and two weeks; and am today using a two mm. aluminum filter instead of one mm. The anterior and lateral surfaces of the neck being flexor surfaces, are covered by rather thin and, as I have demonstrated, radiosensitive skin so that I never give more than three and a half points Hampsen, the plastile resting on the skin and covered with five layers of chamois skin. With this technic I have had no telangiectasia or other signs of radioirritation.

In bedridden or hospital cases I map out nine areas over each lobe of the thyroid, each area being the size of my thirty M. G. double strength radium applicator. I use three mm. of aluminum and one

layer of zinc oxide adhesive plaster which keeps the radium applicator from shifting. The radium is kept on each area four hours, which requires thirty-six hours to cover a moderately enlarged lobe. A nurse or educated person must be in attendance to change the applicator at four hour intervals, care being taken not to cover the same area twice in four weeks. No burn or scar is produced and one to three treatments will usually relieve the patients of their symptoms.

I have recently had a letter from a young lady of Newport, R. I., who had all the symptoms of a typical but early case of hyperthyroidism relieved by one treatment, using the technic described above.

Probably the greatest advances made in knowledge of hyperthyroidism have been made in the past few years. I refer to the metabolism tests. Clinical symptoms used in the past gave one several valuable signs of thyroid intoxication, but it was difficult in that we had no accurate index to measure exactly the degree of this intoxication and disturbed metabolism. Now we can not only state this degree of disturbance in actual figures, but we at last are in position to say just how much any therapeutic measure has improved the patient. In the face of this test the physician with his hobby, be it drugs, x ray, radium, or the scalpel, is compelled to show his wares. For a complete symposium on this subject I shall refer you to an article from the Massachusetts General Hospital (2). Condensed, it dealt with two series of cases of hyperthyroidism, one treated by x ray, the other by ligation and surgical removal of part of the thyroid

gland. Metabolism tests were performed on both sets of patients five years after the completion of treatments and operations. The actual tests showed that the surgical cases at this time were as well as those who had been x rayed, but it also showed that the cases x rayed were actually seventeen and one half per cent. more toxic than the surgical cases before x ray treatments were begun.

If there remains anyone who honestly and conscientiously wishes to know the real value of x ray and radium in hyperthyroidism, who doubts the ability of the ray to cause atrophy of thyroid gland, or who is the least bit sceptical as to the effects of this atrophy on the internal secretion, body metabolism, and symptoms of hyperthyroidism, let them seek the facts—not hearsay or vague clinical findings. We have and can study the pathological specimens which actually show the degree of this atrophy. We also have the exact figures from the metabolism tests showing the precise degree of improvement in cases of hyperthyroidism during the x ray treatments and five years after completion of the treatments. Figures that prove that massive doses of x ray correctly applied over the thyroid gland offers the patient with hyperthyroidism as much or better hope for cure than any form of therapy known, not excepting surgery.

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1219 CONNECTICUT AVENUE.

Some Ophthalmological Implications of Endocrinology

By PERCY FRIDENBERG, M. D.,
New York.

Every advance in our knowledge of the fundamental reactions of living beings to their environment in health and disease accentuates the essential unity and continuity of the organism and the mutual interdependence of its component parts. At the same time, the vital processes such as secretion, and the basic reactions of metabolism, respiration and functional catabolism, are brought into relation with similar reactions in the domain of colloidal chemistry and of physical chemistry. Endocrinology is a step forward from the cellular pathology which looked upon the organism as a histological specimen, and from the narrow bacteriology which considered the body as a culture medium and most disease as an inoculation. In a way, the study of the glands of internal secretion brings us to a reconsideration of some essentially valid facts of the old humoral pathology with its acceptance of individual blood or tissue juice mixtures and dyscrasias to explain personal variations in reaction to diet and drugs, infection and immunity, fatigue and food, as well as to mental and emotional stimuli. The endocrine system, with its relation to the vegetative nervous system, refers to every department of biology; and

the glands of internal secretion influence morphology, heredity, function, and immunity.

The relation of this system to the eye and its diseases is a complicated one. In the first place we have the biological aspect of inheritance, and the influence of race, and of skull form, both largely endocrine, on the shape and consequently the refraction of the eye. Here, too, we think of the origin of pigment from the chromaffin system, and pigment plays a striking part in the structure and in the function of the eye. The eye is in fact the most highly pigmented organ in the body. The retinal changes in vision are practically a dissociation of pigment by photoelectric process and association in the dark and resting. Pigment changes are characteristic of a number of degenerative conditions, some of them typically familial and hereditary, of the light perceptive tissues of the eye. The iris, curiously enough, is the only tissue in which hypernephroma is known to metastasize. The relation of coloring matter to energy is probably a fundamental one which is still a question for experimental biology to solve. The nutrition and normal development of the eye, as of other structures, depends

partly on vitamins, and it is probable that pigment has a certain definite significance in this respect, too. Starvation, improper diet, and even the lack of a single vitamin, notably the fat soluble anti-rachitic vitamin, produces typical ocular disturbances, such as degenerative processes in the cornea, or peculiar visual disturbances, such as hemeralopia. The rôle of hormones and vitamins in ocular development is indicated, further, by the incidence of changes in the cornea and lens, notably cataract, in such typically dyscrinoid manifestations of disordered metabolism as rickets, tetany, and, possibly, pellagra. The retrogression of vital physiological processes accompanying old age is manifested more strikingly in the eye by senile changes such as gerontoxon and cataract, than perhaps in any other part of the body. The marked individual variation in these conditions accentuates the endocrine factor in their causation.

Physiologically, we note that the eye is largely under the double control of the vagus, via the fifth and third nerves, and of the sympathetic. There are several purely ocular reactions which indicate this. First and most important, pupillary reaction and the associated action, accommodation, of the ciliary muscle. This reaction of the pupil to vagus stimulation (sphincter contraction) and to sympathetic irritation (dilator action) has been studied most carefully from its neurological side as well as from the viewpoint of pharmacodynamics. The action of the two main groups of ophthalmiatric alkaloids, the miotics, such as eserine and pilocarpine, and the mydriatics, such as atropine and hyoscine, are typically vagotonic and vagoparalytic, respectively. The pupil has a marked correspondence to the heart beat as an index of emotional stimulation and of the relative dominance of the sympathetic or parasympathetic systems. Broadly speaking, contraction of the pupil corresponds to slowing of the heart, and dilatation, to its acceleration. Intraocular inflammation and irritation are generally accompanied by contraction (vago-tonia) of the pupil, and in but one serious ocular malady, glaucoma, by dilatation. The terminals of the vagus may be influenced directly by pressure on the eye and produce an immediate reaction on the rate of the heart beat, slowing it or increasing the tempo, according to the relative vago-tonia or sympathico-tonia of the subject.

This oculocardiac reflex of Dagnini-Aschner is still a subject of clinical study. Besides the pupil we have winking, tear secretion, and intraocular tension, all of which show a double dependence on the two antagonistic branches of the vegetative nervous system. Vagus irritation appears to inhibit winking, tear secretion, and the entrance of fluid into the eye from the capillaries and endothelium of the uveal tract. The result of the last action is to tend to reduction of intraocular tension. In pathological increase of pressure, narrowing of the pupil by miotics cuts down the glaucomatous tension. Sympathetic irritation stimulates winking and tear secretion, and causes dilatation of the superficial vessels of the eye. The relation of the eye to the orbit is also strikingly affected. Enophthalmos is a sign of sympathetic paralysis, or relative vago-

tonia; and exophthalmos, or prominence of the eyeball, of sympathetic irritation, or relative vagoparalysis. The most dramatic example of the latter complex is in the clinical picture of Graves's disease, an exquisite manifestation of ocular sympathicotonia. The opposite is manifested by the appearance of the eye after injury of the cervical sympathetic, in which we have typical miosis, anhidrosis, ptosis, enophthalmos, and narrowing of the lid fissure. Ocular sympathicoparalysis is indicated, to my mind, by the Argyll Robertson pupil in locomotor ataxia. This reflex pupillary rigidity is largely due to a paralysis of the dilator pupillæ and the consequent failure to react is largely spastic, a failure of the contracted miotic pupil to dilate. In the clinical field, the interrelation of endocrinology and the eye is indicated by facts of infection and inflammation, immunity, and disorders of metabolism. In passing, we notice a series of inflammations involving the cornea in which an element of nerve irritation or injury is invariably active. Such conditions as herpes febrilis, or of keratitis with anesthesia, neuroparalytic keratitis, often occur in association with characteristic disturbances of endocrine balance. Phlyctenular keratoconjunctivitis, but recently hailed and accused as tuberculous on the slender basis of positive reactions to the von Pirquet test, is most probably scrofulous, in the older sense of the humoral pathologists. It is but one manifestation of the exudative scrofulous, or lymphatic diathesis. The others are, tendency to exudations, lymph hyperplasias, urticaria, angioneurotic edema, spasmophile reactions in various fields, indicated by croupy cough, tics and spasms, pylorus cramp, pertussis and asthma, hay fever, frequent, persistent, and recurring head colds. The biochemical basis is an acidosis, associated with marked disturbance of the carbohydrate and fat metabolism. The endocrine factor is probably a relative hypothyroidism due either to repeated infections (bacterial thyrotoxication), heredity, or a morbid dominance of other glands, notably the pituitary. This is indicated in the ocular sphere by the facies of the patient with wide spaced, large, often hypermetropic eyes, broad glabella; by disturbances, such as headache and vertigo, out of all proportion to the refraction error which may be found, and by the beneficial effects of thyrosympathetic stimulation by such drugs as atropine, calcium, and the iodides. Of deeper seated ocular inflammations, those of the uveal tract are important. Syphilitic, tuberculous, gonorrhœal, and rheumatic uveitis were always recognized as the principal categories. We must deal with the factor of dyscrinism in each of these varieties. In addition we have the important group of iritis due to focal infections of teeth, tonsils, sinuses, and intestinal tract, with their implications for disturbances of nutrition and of actual damage to the glands of internal secretion in their immunoprotective faculties. The relation of renal disease and of diabetes to retinitis and to cataract, respectively, is an important chapter on which we merely touch in passing to call attention again to the endocrine factor which runs, like the red thread of the British Admiralty, through all.

Rheumatism and the arthritic conditions, as well as gout, have their well known ocular reactions, in the connective tissues of the eye, conjunctiva, sclera, and cornea, and in the uveal tract as well. The lowered metabolism incident to the basic disease seems to be the most important factor in producing not only the joint and muscle lesions, but the ocular disturbances as well. Certain it is that the removal of infected tonsils and of adenoids seems to be only one of the beneficial factors active in operative treatment. The starvation preceding and following the surgical procedure seems to be of importance, too. A logical conclusion would be that in rheumatic iritis we should cut down alimentation as far as possible, aid elimination, and stimulate the metabolic function of the thyroid. It is noteworthy that many of our empirical procedures act on this tacit assumption and in this way. Thus we explain the good effects of cathartics, alkalines, iodides, massage, heat, and passive motion, to say nothing of atropine. Glaucoma is a condition about which a long chapter could be written. The theories of its causation are largely mechanical and have to do with topographic relations of lens and anterior chamber, the dimensions of the filtration angle, the rigidity of the sclera, the size of the circumferential space, and so on. These factors probably do play an important rôle in providing an anatomical, structural, predisposition. The necessity of another factor has been recognized by the neurotic secretory theories, and the colloidal chemistry view which considered glaucoma as an essential edema on an angioneurotic basis. The endocrine implications are striking. We have to do with a marked and sudden paralysis of the ocular vagus with an equally marked overaction of the sympathetic. This symptom complex comes on at an age when there is a tendency to relative hyperthyroidism on account of the recession of the internal secretion from the gonads. The climacteric, male as well as female, is the typical epoch for glaucoma. Then, it is unusually common in the Hebrew race which has what we call a bad inheritance, sympathetically speaking, as indicated in the incidence of neurasthenia, speech defects, and diabetes.

The emotional element is further indicated by the sudden appearance of an attack after worry, anger, exhaustion, cold, or operation on the other eye. Again, the element of the vegetative nervous system is indicated by our using empirically and successfully in the acute attack of glaucoma, heat and rest, morphine and coffee, dionine and pilocarpine, all of which stimulate the parietic vagus and restore the endocrine reserve. A prophylactic inference would be the advisability of using small doses of vagotonic drugs and of those which may have a sedative action on the sympathetic and the thyroid, perhaps by the administration of antagonistic glands (pituitary, gonads) where there is a racial, age, or individual tendency to high intraocular tension and so to acute glaucoma.

Ocular headache is another topic about which volumes could be, and have been, written. In connection with other manifestations of eye strain, local and reflex, this forms an important part of the oculist's field of activity. It is striking that the

symptoms are often out of proportion to the refraction error, and that rest cures with complete paralysis of accommodation (atropine, cycloplegia) act immediately, although often only temporarily. Correction of the refraction error often gives little relief, and this applies as well to the prescribing of prisms or decentred lenses for imbalance of the extrinsic ocular muscles, for insufficiency of convergence, and so on. The endocrinological implications here are physiognomonic, as well as therapeutic. The patients who tend to eye strain are likely to be brunettes with vagotonic and relative hypothyroid makeup, that is, of a pituitary-adrenal or gonadopituitary type. Their refraction is hypermetropic or astigmatic hypermetropic, the pupils small, eyes recessed, narrow fissure; their general reaction spasmophilic, with cramps all over, sphincter spasms, stomach cramps with acidity, freaks of temper and emotion, attacks of indigestion.

The opposite type of patient comes to us with complaints of asthenopia, that is, of deficiencies, weaknesses instead of strain. Thus rapid tiring in the light, with reading, or sewing on white work, headaches at theatre, the cinema or in art galleries, in a word, retinal asthenopia. These patients are more likely to be blonde, full blooded, wide eyed and with wide pupils, full, vascular lids and conjunctivæ, and prominent eyeballs. The refraction is generally myopic. These patients have, evidently, more than enough of the thyroid principle. They need adrenal, gonad, or pituitary restoration, and drugs to depress the sympathetic system.

The first mentioned, vagotonic, group is materially benefited by atropine systematically as well as locally, and by small doses of thyroid, and many of the peculiar reflex symptoms disappear promptly. The wearing of correcting glasses probably cuts down one source of vagus irritation and the same effect is produced physiologically by rest cures, dark room treatment, and full cycloplegia.

If we study the endocrine markings and manifestations of our eye patients and the ocular symptoms of our endocrine types and dyscrinisms we shall in time be repaid by a better knowledge of the underlying relations between the glands of internal secretion and the eye and its diseases.

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Qualitative Variations in the Structure of the Thyroid.—G. Vercellini (*Endocrinology*, January-March, 1920) came to the conclusion that in normal conditions the human blood serum has *in vitro* a powerful oxidizing action on hydroquinon, due to a substance soluble in ninety-six per cent. alcohol and thermostable; this power increases a great deal in cases of paresis, and to a less extent in epilepsy—that is, the oxidizing power is more marked during the interaccessual periods, less before the seizure. Owing to the fact that in these two diseases in which cyclic groups with oxybenzolic structure are found, the blood serum offers an increased oxidizing power toward such substances, the author asks if it might not be possible, with this reaction, to recognize *in vivo* the presence of these qualitative thyroid variations.

The Clinical Value of Basal Metabolism Determinations in Diseases of the Thyroid Gland*

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The first intimation that the metabolism in exophthalmic goitre was abnormal was given by Friedrich Müller in 1893. He found an increased nitrogen output, and thus demonstrated an excessive protein destruction in this disease. This comparatively simple observation was the starting point for the many experiments and studies that have served to illuminate the problems of hyperthyroidism and hypothyroidism. Upon them the rational principles of treatment have been based. Very recently the methods of estimating the metabolic rate have been simplified a great deal, and it is possible to make rapid and frequent observations of the basal metabolism. These determinations provide what is acknowledged to be the best means of making a diagnosis of overactivity or underactivity of the thyroid gland, and, furthermore, they furnish criteria which guide the surgical, röntgen ray, and medical treatment. By the examination of the figures obtained in determining the basal metabolism in various diseases, the following results will be noted:

TABLE I.

Basal metabolism as reported in various diseases. Percentage above or below average normal. ¹		
Normal	.....	-15 to +15
Obesity	.....	-14 to +10
Diabetes mellitus	.....	-19 to +23
Severe	.....	-19 to +23
After fasting	.....	-36 lowest observed
Emaciated	.....	-37 to -10
Cardiorenal without dyspnea	.....	-10 to +10
Cardiorenal with dyspnea	.....	+25 to +50
Nephritis with edema	.....	-40 to +14
Nephritis without edema	.....	+2 to +29
Pernicious anemia	.....	+2 to +33
Leucemia	.....	+21 to +123
Typhoid fever	.....	as high as +50
Tuberculosis (temperature about 104°)	.....	+15 to +35
Tuberculosis (no fever)	.....	-3 to +15
Prolonged undernutrition	.....	-30 to -10
Exophthalmic goitre:		
Very mild	.....	+15 to +30
Mild	.....	+30 to +50
Severe	.....	+50 to +75
Very severe	.....	over +75
Cretinism and myxedema	.....	-40 to -15

¹ These figures have been taken largely from the publications of E. F. DuBois and his collaborators though other sources have been consulted.

Tuberculosis, cardiac disease, undernutrition, obesity, and certain nervous affections may lead to the suspicion that the thyroid gland is functioning too actively or too little. In the event of necessity of differential diagnosis under these circumstances the determination of the basal metabolism is of great assistance, inasmuch as all of the conditions mentioned vary much less from the average normal basal metabolism than do abnormal thyroid states. Other maladies, such as leucemia, cardiorenal disease with marked dyspnea, or typhoid fever, in which the basal metabolism approaches the intensity of that reached in exophthalmic goitre, may be diagnosed by physical examination and the usual routine laboratory tests without having recourse to the determination of their metabolic rate.

One of the best examples of the diagnostic value

*Read before the Medical Section, of the New York Academy of Medicine.

of the determination of the basal metabolic rate in medicine is that furnished by Peabody, Wearn and Tompkins (1). Of fifty-seven soldiers submitted to them for treatment, principally because of rapid heart action, nervous instability and physical inferiority, a diagnosis of hyperthyroidism was made in twenty-four. The normal metabolic rate exhibited by these individuals disproved the diagnosis. This investigation shows conclusively that nervous patients do not necessarily have a high basal metabolism. Nervousness, tremor, slight enlargement of the thyroid gland, lagging of the eyelids, and tachycardia were present in many of these patients; these signs and symptoms may therefore be considered of minor importance in making the diagnosis of Graves's disease. Bruits and thrills over the thyroid gland, a tachycardia which persists when the patient is at rest, and loss of weight, appear to be of greater significance.

The data obtained in individual cases may possibly serve to illustrate the usefulness of the basal metabolic rate as a diagnostic measure better than generalities. The following is the synopsis of a case referred as one in which it was indicated to determine the intensity of the hyperthyroidism:

CASE I.—A woman, forty years of age, house-keeper. She had been exceedingly nervous and irritable, and her sleep was considerably disturbed. She had complained of sweating, chilly sensations, and hot flushes, during the day as well as at night. She had no reserve strength, and became very easily tired. There had been a loss of weight of twenty-eight pounds in three years. Some dyspnea was present when the patient was quiet, and this was considerably aggravated on exertion. She complained of cardiac palpitation; vomiting and diarrhea had not been manifest at any time. Physical examination showed the patient to be rather thin (weight 110 pounds, with clothes; height, five feet three inches), and very nervous. There was a distinct tremor, a pulse rate of 120 which dropped to 84 on resting. The skin about the face and neck was hyperemic, but was otherwise normal. There was no exophthalmos, no Moebius's or Von Graefe's sign, and examination of the thyroid gland revealed no abnormalities.

After treating her with various forms of therapy, which did not prove to be of value, her physicians were considering the advisability of more active interference with the functions of the thyroid gland; the possible diagnosis of Graves's disease certainly seemed justified. Her basal metabolism proved to be 94.3 per cent. of the normal standard, and, therefore, well within normal limits. Hence this patient's symptoms were not due to hyperthyroidism, and attempts to curtail the activity of the gland, while they might serve to ameliorate some of the complaints, would be likely to play havoc in other directions.

A case which illustrates the difficulty of diagnosing Graves's disease from the history and physical examination alone is the following:

CASE II.—A tailor, a Russian Jew, complained of epigastric distress for two years, and pains in the right lumbar region for one year; all the large joints ached at times. There were frequent and severe headaches; he was very constipated and had never had diarrhea. The thyroid gland was slightly enlarged, but gave no evidence of bruits or thrills. There was a very slight prominence of the eyeballs, but all other eye signs were negative. A fine tremor of the fingers was present; the pulse rate at different times varied between 84 and 120; the hands were cold and blue. The history and physical examination gave the impression that this was a case of nervous instability resembling the instances of neurocardiac asthenia that gave rise to so much discussion during the war. His basal metabolic rate, however, was forty-one per cent. above the normal value. This figure was too high to be accounted for by possible restlessness during the determination or by the slight tachycardia. The inevitable conclusion was that there was a distinct overactivity of the thyroid in this man.

The nervousness, tremor, and suggestive exophthalmos were virtually the only ones of the accepted signs of hyperthyroidism that were present. Why the tachycardia was not constant, why the eye signs were not more definite, why there was no diarrhea, are questions that can be answered in many different ways. However, it brings up the very important clinical fact that many of these cases apparently present a dissociated group of symptoms that render it very difficult at times to make accurate diagnoses or to obtain ideal therapeutic results. Thus we have had one patient who complained of cardiac palpitation after the use of thyroxin and thyroid extract, although her basal metabolism was still fourteen per cent. below normal. In another instance there was marked excitability and nervousness, although other signs indicated hyperthyroidism, and the metabolic rate was 23.2 per cent. below the normal figure.

In this case the administration of thyroid gland had a distinct tendency to produce diarrhea and increase the nervousness without materially affecting the pulse rate, the weight, or the feeling of lassitude. In this patient there had been a complete hysterectomy some years before. The question of the depression of the basal metabolism, through loss of the ovarian function, is suggested by these findings. Janney and Henderson (2) described two similar cases in which the ovaries had been removed. In these the basal metabolism could not be brought to normal, as symptoms of distress, palpitation and rapid pulse intervened even on small thyroid doses.

In occasional instances, the basal metabolism apparently does not serve as an exact indicator of the activity of the thyroid gland. Janney and Henderson report a case with thyroid hypertrophy, tremor of the fingers and tongue, sympathicotonia, moist palms and soles, nervousness, excitability, exophthalmos, Stellwag's sign, rapid pulse on slight provocation, and loss of weight and strength, while the basal metabolism was five per cent. below normal. These authors believe this to be a case of

exophthalmic goitre in spite of the normal metabolic rate. In one of our patients, a very obese, lethargic woman, the basal metabolism proved to be normal. She was given thyroid cautiously and this was gradually increased to the rather large dose of fifteen grains a day, which was maintained for more than six months. During this period the lethargy diminished very markedly, there was some loss of weight, the pulse rate going up only to 80 after exercise, and the temperature continued to be subnormal. The only signs of too large a dose of thyroid substance were excessive perspiration and a headache which came on every one or two weeks. Both of these cases are possible examples of disagreement between what appear to be justifiable clinical diagnoses and the basal metabolic rate. Such occurrences are exceptions, and it is a matter of further study and observation to clear up the exact relationship of such findings.

Clinical signs and symptoms have been sought which would parallel basal metabolism determinations and thus make such estimations of secondary importance. The two criteria most often used are the pulse rate and the weight. Neither of these appear to meet the demands as a measure of the intensity of thyroid activity as satisfactorily as the estimation of the metabolic rate. The conclusions of some of the observers who have worked extensively on these problems are of interest. Sturgis and Tompkins (3) conclude that there is a fairly constant relationship between the resting pulse and basal metabolism; a tachycardia of 90 or higher was associated with a basal metabolism of fifteen per cent. or more above the normal in all but sixteen per cent. of 154 patients with hyperthyroidism; when the basal metabolism came to normal the pulse came to below 90 in seventy-eight per cent. of the cases; the pulse rate gave an accurate idea of the course of the disease compared to basal metabolism in eighty-five per cent.; the fact that a pulse rate below 90 during complete rest is seldom, and below 80 a minute is rarely associated with an increased metabolism, is of practical importance in the recognition of a group of nervous patients whose symptoms resemble those occurring in hyperthyroidism.

Means and Aub (4 and 5) draw conclusions that vary somewhat from those of Sturgis and Tompkins. They find that the pulse rate is not an index of the absolute degree of thyroid intoxication, but that the pulse rate does furnish a relative index in the same patient seen at different times; that is, as the basal metabolism rises or falls, the pulse rate in the same person increases or diminishes proportionately, but a given pulse rate is not an indication of a corresponding basal metabolic rate in different individuals. In making comparisons between the pulse rate and the basal metabolism, they use a standard by which pulse rates of 50 and 150 are equivalent respectively to a normal metabolic rate and to a rate 100 per cent. above normal. On this basis there are two types of hyperthyroidism: type I, in which the pulse rate is ten or more above the metabolic rate, and type II, in which it is ten or more below; type I, that with the more marked tachycardia, does equally well on being treated with x ray or surgery, while type II apparently gives poor results with immediate resort to surgery, but does better with

preliminary use of x rays. From the conclusions and the experience with tachycardia which any clinician has at his disposal, it is safe to say that from a diagnostic point of view the pulse rate is not as reliable a diagnostic sign as the metabolic rate.

The only other symptom which has been proposed as a measure of the intensity of thyroid activity or progress of thyroid disease is the loss or gain in weight, and here the comparisons with the metabolic rate are very far from being absolute criteria of one another. Thus Means and Aub find a reciprocal relationship between the weight and basal metabolism in only twenty per cent. of their cases.

The basal metabolism furnishes the best measure by which to gauge the effect of medication, x ray or operation. Most of the published results indicate that this is a simple matter. A closer study of many of the tables, however, shows that the final cure can only be accomplished after months of effort. The metabolic rate is the only test that gives a satisfactory answer to the difficult question whether the activity of the thyroid needs further curtailment or whether thyroid medication should be increased. The following instance may possibly accentuate this point:

In April, 1919, a young woman of twenty-eight had the right lobe, isthmus, and part of the left lobe of her thyroid gland removed. Before the operation her basal metabolism was thirty-four per cent. above normal; after the operation it dropped to twenty-four per cent. above normal; one year and seven months after the operation the metabolic rate had almost returned to the preoperative level, being thirty-two per cent. higher than the average normal. Hence, in this case, the nervousness, tachycardia, etc., which persisted in spite of the operation, were not due to nervousness, as it was tempting to assume,

but to overactivity of the remnant of the thyroid gland.

The value of basal metabolism in diseases of the thyroid gland may be compared to that of hemoglobin in the anemias. In many cases no hemoglobinometer is necessary to determine the grade of anemia existing; in some instances, on the other hand, inspection of the skin and mucous membranes is very deceptive. The proper laboratory test gives us, in both conditions, a correct orientation as to the intensity and nature of the process. It is obvious that in a disease whose treatment involves the permanent interference with vital functions, by surgery or x ray, such a test as basal metabolism furnishes an indispensable factor in judging whether the activity of the thyroid gland is normal, increased or diminished, in forming an accurate estimate of the intensity of the disturbance, and finally in guiding the administration of thyroid preparations, the use of sedatives, rest, x ray, or surgery. The fact that many cases may be diagnosed without the aid of this test of precision is no reason to neglect it as some clinicians seem to be desirous of doing. It is a great satisfaction to have a means at hand by which at least one disease in the field of endocrinology may be robbed of its mysticism and exaggerated prevalence, and be properly diagnosed and treated.

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Basal Metabolism and Endocrine Manifestations*

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The importance of endocrine study does not lie in the appreciation of the well known endocrine syndromes. If endocrinology has done anything for medicine at all, and many of us believe it has done a great deal, it has taught the clinician to be a better observer and has broadened his outlook. It has added to his attitude of merely looking for extraneous factors in disease, a better appreciation of the patient's reaction. Heretofore medicine consisted largely of the recognition of anatomical change in organs, and a patient who did not present such morphological evidence was considered unworthy of the clinician's serious attention.

The appreciation of the relation of the endocrine system to medicine is gradually developing what we might term physiological medicine or the study of

the changes in the physiology of the patient as the result of his contact with extrinsic factors, such as bacteria and other irritants. On the other hand, the abnormal physiology may be the expression of a discord between the patient and his environment. This conception of clinical medicine does not abandon the appreciation of pathology, but it aims to recognize abnormal physiology as well. Indeed, both usually occur together, but abnormal physiology may precede the establishment of a lesion or the lesion may not be recognizable by our present methods, which are relatively gross at best.

In such a conception, function plays an equal part with structure, and the so-called functional diseases assume the same importance as the organic diseases. Clinically we can appreciate the rôle of the endocrine system in medicine in several categories:

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1. The definite endocrine syndromes may manifest themselves in minor forms; the so-called *forme fruste*. Consequently they frequently pass recognition and mask as various visceral diseases.

2. A definite endocrine syndrome may begin with various visceral symptoms and the identifying symptoms may only appear later. Here, too, a lesion or functional disturbance of the viscera to which the symptoms are referred is diagnosed.

3. The various symptoms of a definite endocrine syndrome may differ in the intensity with which they dominate the clinical picture. Consequently the condition is not recognized unless the entire clinical picture is taken into account.

4. The definite endocrine syndrome corresponding clinically to any of the groups described above may be merely a symptom; the expression on the part of the patient as the earliest manifestation of a well known disease, such as tuberculosis for instance. It is well known to any experienced clinician that tuberculosis may begin with emotional upsets, tachycardia, fine tremors and loss in weight. In addition to these symptoms there may be associated gastric symptoms which may even dominate the clinical picture; and at this time no cough and no physical signs are present to indicate the arising infection. Other infections may be initiated in the same way. Only later when the infection is full fledged can we correlate the entire clinical picture into one etiological entity.

To my mind these early symptoms—in tuberculosis, for example—are really part of a hyperthyroidism, but a symptomatic hyperthyroidism. It is well known that the endocrine system, notably the thyroid and adrenal, plays an important rôle in immunity. This clinical evidence of a hyperthyroidism, therefore, is really the clinical expression of activation of the immune processes. At this time the exciting cause may not be apparent until it overcomes the immunological effort and establishes a recognizable lesion.

5. The careful study of the patient himself in various diseases, from a morphological, physiological and psychic point of view, seems to indicate that individuals suffering from the same disease have characteristics more or less in common. This is also true of normal individuals who react to environment and the exigencies of life in the same way. Now, since the endocrine system is responsible for growth and development, and since we know that each endocrine gland plays its own peculiar rôle in the development and growth of specific structures as well as in the physiology and psychology of the individual, we can group patients and individuals into characteristic types. These types show individual structural, physiological and psychic markings, indicating the domination of one or more endocrine glands, and are called tropisms, such as adrenotropes, thyrotropes, pituitotropes, and pituitogonadotropes. While these tropisms frequently do bear a relationship to susceptibility, this susceptibility is not necessarily specific.

The endocrine gland which dominates the endocrine physiology is naturally more highly sensitized than the others. Consequently it is more subject to injury, with resultant functional deficiency, dis-

turbance in endocrine balance and compensatory phenomena. This injury may be an infection or it may be a disturbance in the relation between the nervous system and the endocrines. For example, in adrenotropes adrenal insufficiency develops in infections and otherwise, more commonly than in others. In thyrotropes, hyperthyroidism develops, and so on. I have seen the most classical case of adrenal insufficiency recently in an adrenotrope, following an attack of scarlet fever.

To determine the various phases in which the endocrine system presents itself in various medical conditions we have to rely as yet largely on clinical grounds. And since, as I have attempted to indicate above, this rôle rarely presents itself as a frank syndrome the actual difficulty of establishing evidence of an endocrine disturbance, causative, associated or otherwise, is multiplied. Nor should we minimize the value of good clinical observation. Laboratory methods have come and gone while many clinical observations have persisted for centuries. I have paid a great deal of attention in recent years to the newer work on blood chemistry in chronic nephritis. Yet the classification and clinical facts established by Dr. Delafield some twenty-five years ago have not been altered. The only difference is that we speak in different terms. Dr. Delafield spoke in terms of clinical data while today we speak in terms of blood chemistry. But the facts established by the clinical data run parallel with the more measurable facts obtained by chemical analysis of the blood.

Nevertheless, the conservative physician's skepticism is justified in accepting evidence of thyroid deficiency, for instance, on the basis of a few scanty hairs on the eyebrow or an evanescent drowsiness or evidence of a dyspituitarism on the basis of a mild adiposity and slight genital atrophy. The burden of proof is on the endocrine enthusiast and he should not permit his feelings to get the better of his reason. Consequently no one is hungrier for exact methods of determining endocrine disturbances than the endocrinologist himself.

At the present time the most exact method for determining certain endocrine disturbances is the study of the basal metabolism. I shall therefore review briefly the salient facts that have finally placed this exact method on a practical basis. It is well known that the metabolism of an individual is variable according to many factors, such as muscular exercise, psychic activity, sleep, digestion, age and sex. It has been definitely established, however, that the level of an individual's metabolism while at rest and after twelve to eighteen hours' starvation is constant, varying only with certain determinable factors. This is known as the basal metabolism. This varies only with the sex, age, and as Rubner has shown long ago, with the body surface. Dubois has worked out certain linear formulæ for the determination of the patient's body surface from his weight and height. Aub and Dubois have thus been able to work out certain normal figures for the basal metabolic level for various ages and for both sexes.

By measuring the rate of oxygen intake and multiplying this by the caloric value of a litre of oxygen

at the respiratory quotient, which is the ratio of the quantity of oxygen consumed to the quantity of carbon dioxide eliminated, we determine the patient's basal metabolic level.

In some of the apparatus the determination of the basal metabolism has been simplified, so that it can be determined by measuring only the oxygen intake, and then figuring the basal metabolism according to the tables of Dubois. This is possible because the caloric value of oxygen is not very much affected by varying the respiratory quotient, and by assuming 0.82 as the respiratory quotient, a figure which has been found to be the average of a large number of determinations. The recent development of a number of practical indirect calorimetry apparatus such as the Benedict, the Jones, and others, has placed the basal metabolism determination on a practical basis. When these apparatus become still more simplified the determination of the basal metabolic level will be just as simple as a blood pressure reading.

Since the basal metabolic level is constant for the age, sex and body surface of the patient, any variation from this level is of pathological significance. We know, however, that the endocrine glands are the chief regulators of metabolism; consequently, any significant change in the patient's metabolic level in the absence of fever (which causes an increase) is indicative of a disturbance in some of the glands of internal secretion. Numerous observers, notably Plummer, McCaskey, Tierney and others have reported changes in the basal metabolic level in some of the well known endocrinopathies. We may summarize their results briefly as follows:

1. In hyperthyroidism the basal metabolic level is raised in proportion to the clinical intensity of the condition.

2. In myxedema the basal metabolic level is diminished in proportion to the clinical intensity of the case.

3. In dyspituitarism with adiposity the basal metabolic level is slightly diminished.

It is not my object in this paper to add my basal metabolism determinations in the frank endocrine syndromes to the cumulative evidence, as they merely corroborate the findings of others. I wish, however, to present a number of cases to indicate the clinical value of basal metabolism determinations as an aid in establishing an endocrine phase in a number of common medical diseases in which we had reason to suspect such a relationship from a careful study of the subjective and objective clinical findings. I am reserving for a future paper, however, a more extensive study of a large volume of similar cases. The basal metabolism readings were determined by the Jones apparatus.

The patients herein reported, suffered from various common conditions in which an endocrine phase was manifest either as a *forme fruste* as a masked frank endocrine syndrome, as a symptomatic endocrine syndrome or as a tropism with injury of the dominating gland.

We must not rely, however, on the basal metabolism determination nor on the clinical findings

alone, but on the proper combination of both. But since the basal metabolism is determined by a more or less exact and measurable method, it is perhaps more reliable.

CASE I.—M. B., a married woman forty-one years of age, came under observation in October, 1920, complaining chiefly of pains in the spine, particularly in the lumbosacral region and in the neck. Chiefly on account of the pains in the lumbosacral region a hysterectomy was done about two years before. I could not determine what the pathology of the uterus was at the time it was removed. At any rate the symptoms did not improve after the operation and similar pains developed in the arms and legs. About ten months ago the patient began to notice occasional slight puffiness of the eyelids and epigastric pain bearing no relation to meals. At times she felt drowsy in the afternoon and was always tired. Her skin was dry and scaly and her hair fell out at times. She rarely perspired. Except for measles in childhood and a rather indefinite attack of rheumatism about twelve years ago, she had never been ill. There was nothing in her family history or in her habits that was relevant or of etiological value.

The patient was a rather stout lethargic middle-aged woman of medium height. Her skin was dry and somewhat scaly; there was no rash on the skin, no pigmentation, and no Sergent's line. There was no general glandular enlargement. The scalp was covered by a rather abundant growth of hair but was full of dandruff. The eyebrows were rather thin in the outer half. There was slight edema of the eyelids. The corneae were dull and listless, the pupils were round, equal, and they reacted to light and accommodation; there was no exophthalmos. The nose and ears showed no abnormal changes. The teeth were in poor condition, and there was a purulent secretion from the sockets. The thyroid was not readily palpable, but was present. There were no supraclavicular fat pads.

The chest was normal in shape and contour; the expansion was good; the breasts were small. The lungs and heart were normal; the pulse was 64, the blood pressure systolic 110, diastolic 90, and there was no evidence of arterial thickening. The abdomen was not distended, the abdominal wall rather thick, no signs of fluid, and no tenderness or rigidity. The abdominal viscera were normal. There was considerable tenderness on pressure in the lumbosacral region of the spine and there were fat pads on either side of this region. There was tenderness along the cervical spine.

The extremities showed slight puffiness of the ankles; there was marked tenderness on pressure over the muscles of the arms, and movements of the shoulder joints elicited marked pain. Vaginal examination showed a stump of a cervix and rectal examination showed only a few hemorrhoidal tabs. Examination of the nervous system showed no evidence of any organic nervous disease.

Laboratory examinations: The urine showed a specific gravity of 1.024, acid, no albumin, no sugar, no indican; microscopically no casts, only a few epithelial cells. Blood examination showed the

red blood cells 3,800,00, hemoglobin eighty-five per cent, white blood cells 9,000; polynuclears forty-six per cent; small lymphocytes thirty-two per cent.; large lymphocytes twenty-four per cent.; Wassermann reaction negative. Goetch test was negative (absolutely no reaction). Vagotonic test was negative. Basal metabolism was -22 per cent.

There was no evidence of any organic disease in this patient. The slight puffiness, the rather dry scaly skin, the lymphocytosis, the dull listless condition, and the scanty hair on the outer eyebrows suggested thyroid deficiency which was corroborated by the minus twenty-two basal metabolism. Since we have objective evidence of thyroid deficiency, it is logical to explain the symptoms in the joints on this basis. The lesion is probably an infiltration into or around the joints.

The patient was put on small doses of thyroxin and within two weeks the pains had disappeared and about three weeks later the puffiness around the ankles had disappeared. She is now alert and active and the basal metabolism test taken about the middle of January was -4 per cent.

CASE II.—F. E., a young girl of about twenty-five came under observation in July, 1920. About two months ago she began to have crying spells and general emotional irritability without any apparent cause. She had become exceedingly nervous, was unable to sleep, had developed persistent pain in the right hypochondrium after meals and was constantly losing in weight. She had no cough, no expectoration, and no temperature.

About four years ago she went to Saranac on account of an early pulmonary tuberculosis which began rather acutely with a severe hemoptysis following an attack of bronchopneumonia. Several months before this she had gastric symptoms similar to the present on account of which she had her appendix removed. She had scarlet fever and measles in childhood and her tonsils were removed when she was ten years of age. There was nothing in her habits or family history that was relevant to her condition. Her father, who came with the patient, was apparently an adrenotrope.

The patient was a rather thin young woman, five feet one inch in height, weighing ninety pounds, temperature normal; no rash on the skin, no pigmentation, and no Sergent's line. Her face was slightly flushed and she blushed frequently and readily. The scalp was covered by an abundant growth of lustrous hair. The features were thin and delicate; the nose was thin, the corneæ were bright. The pupils were round, equal, and reacted to light and accommodation; there was no exophthalmos. The teeth were pearly white, in excellent condition. The tonsils were absent and throat congested. The thyroid was palpable but not enlarged. The chest was normal in shape and contour; expansion was good and the costal angle acute. The lungs showed evidence of a small healed spot in the right apex which showed no physical signs of activity. The heart was normal except for a slight tachycardia. The pulse was 100, the blood pressure 110 systolic, 80 diastolic. The abdomen was not distended; there was slight tenderness on pressure in the right hypochondrium. There was a marked ptosis of the stomach; the lower border extending

to the level of the navel. The other abdominal viscera were apparently normal. The extremities showed a fine tremor of the hands.

Laboratory examinations: Several sputum examinations were negative for tubercle bacilli. Examination of the urine showed specific gravity to be 1.006, acid, no albumin, no sugar. Microscopically, no casts; only a few epithelial cells. Blood count: Hemoglobin, eighty-five per cent.; white blood cells, 10,500; polynuclears sixty-five per cent.; small lymphocytes, twenty per cent.; large lymphocytes, fifteen per cent. Gastric analysis after an Ewald test meal showed free hydrochloric acid four, total acidity fourteen, and a few well digested starch granules. Goetch test moderately positive. Vagotonic test negatives. Basal metabolism $+26.5$.

This patient was under constant observation and her chest was examined repeatedly. About two months after she first came under observation, râles developed around the border of the old lesion in the lung, and tubercle bacilli were found in the sputum. The patient was suffering from emotional irritability, nervousness, tachycardia, gastric symptoms and loss in weight. This clinical picture constitutes a mild hyperthyroidism. This is corroborated by the positive Goetch test and the increased basal metabolic level. In view of the fact that she had an old healed tuberculous lesion in the right apex and that this lesion began with somewhat similar symptoms, it is rational to consider this hyperthyroidism as a symptomatic hyperthyroidism. It may be considered as an early indication of activity of the old process, although the lesion itself did not show any signs of activity until two months later. The rôle of the thyroid and adrenal in immunity is well known, and the overactivity of the thyroid in this case is really the expression of an effort to overcome an arising infection.

CONCLUSIONS.

1. Endocrine manifestations occur in common medical diseases other than the frank syndromes in several forms: a, as a *forme fruste*; b, as a visceral disease in which the endocrine phase is masked by the visceral symptoms or as the earliest manifestation of the frank syndrome; c, as the earliest manifestation of a systemic infection; d, as an endocrine tropism with functional insufficiency of the dominating gland.

2. The recognition of these endocrine manifestations in various common diseases has heretofore been based largely on clinical grounds.

3. Since the basal metabolic level is raised in thyroid overactivity and lowered in thyroid deficiency, we can use the determination of the basal metabolic level as an aid in determining the presence or absence of thyroid overactivity or deficiency in various common diseases which show such clinical signs.

4. A number of illustrative cases are presented in which endocrine disturbances in common medical conditions are determined by means of the basal metabolism determination, in conjunction with the clinical signs.

Three additional cases were reported by the author, one of migraine attacks with evidences of thyroid deficiency, one of mild hyperthyroidism with dominant gastrointestinal symptoms and one that of an adrenotrope with adrenal insufficiency and gastric symptoms. These case reports will appear in full in the author's reprints.

The Relation of Endocrine Disturbance to Tinnitus Aurium*

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Internal glandular secretions, their activities and deficiencies, constitute the most important question in internal medicine at the present time. In this connection I have made a special study of tinnitus aurium, with such remarkable results that an early report is warranted.

In reviewing tinnitus aurium we find it is a condition in the auditory apparatus in which pathological sounds varying in type and intensity are produced. It is one of the most distressing affections, especially when the noises are loud and continuous. The sounds may be experienced as whistling, buzzing, hissing, blowing, ringing, or roaring. They may be intermittent or constant, high or low pitched and may vary from a very mild to a very distressing condition. These noises are increased by menstruation, pregnancy and lactation.

The origin or cause of this condition has never been understood. Most writers attributed it to either an interference with sound waves due to tubal obstruction or to the interference of the sound perceiving apparatus. Other given causes are tubal catarrh, chronic otitis media and auditory nerve irritations. It also exists in otosclerosis and toxemias of various types, or may be due to overindulgence of the sexual function or intoxicants. All writers agree that this condition arises from a stimulation somewhere in the auditory tract, either peripherally or centrally and either direct or reflex. Cases are reported where the agony and insomnia from these continuous noises were so intense that they drove the unfortunate victims to suicide.

The previous treatment of tinnitus aurium was most unsatisfactory. Most methods consisted of inflating the Eustachian canal, its dilatation with bougies, massaging the drum and ossicles with a Seigle's otoscope, the application of electricity, etc.

The success of the treatment of tinnitus aurium by glandular therapeutics depends upon the condition being a symptom resulting from gland exhaustion, or due to a deficient activity of the adreno-thyroid apparatus. The extract of a gland organ will exert an exciting influence in the same organ so that a sluggish gland can be prodded into activity to a degree quite beyond belief and result in a glandular readjustment. The thyroid gland is undoubtedly largely responsible for the distressing symptom of tinnitus aurium. This can be explained by a thyroid deficiency causing a generalized infiltration in which cellular growth and oxidation is interfered with throughout the body. When this infiltration affects the auditory apparatus we get the characteristic symptoms of tinnitus aurium without any definite ear lesions. Sajous describes this as an anemia of this special sense organ, accounted for by the low blood pressure present, as well as by the poverty in the oxidase, its oxidizing principal, causing impairment of hear-

ing and tinnitus. According to Gake, adrenal insufficiency is a potent cause by producing either anemia and mental fatigue or congestion of the labyrinth.

In a series of sixty cases in which tinnitus aurium existed without any disease of the ear, thyroid extract was the routine gland substance administered. A quarter to a half grain three times daily was given, and the patient watched carefully for symptoms of overdosing. Some patients reported improvement on the third day and others at the end of a week. About seventy per cent. of the patients responded to thyroid. Some of these were free from ear noises in two months, others improved greatly and continued calling at the clinic regularly with the hopefulness of being relieved entirely. In ten per cent. of this series of cases thyroid either had no effect at all or else improved them but slightly. In such cases adrenalin substance total gland, two grains three times daily, was given. This produced marked amelioration of the symptoms, but not as quickly or completely as thyroid.

From ten to twenty per cent. of these cases did not respond to glandular treatment. These patients were the very old chronic cases which have been coming to the clinic for the past ten years. One male, aged sixty, obtained relief at first with orchitic substance, but this was only temporary, and further treatment with internal glands proved futile. This can be accounted for by a degenerative process of the ductless glands due to old age and resulting in an autointoxication.

Ovarian extract in five grain doses, three times daily, was tried in several cases, with good results. One patient reported the return of her menstrual flow to normal, with the cessation of her tinnitus aurium, and had been free from this condition for two months. She had given a history of her menstrual flow becoming irregular and scanty with the onset of the tinnitus.

The results of these experiments warrant further study on this subject in its relation to all functional nasopharyngological conditions. The future treatment of functional disturbances depends upon the interest of the medical profession in internal secretory glands. Otolaryngologists will do well to study endocrine disturbance in relation to tinnitus aurium.

Organic diseases will not respond to endocrine treatment which will only affect functional disturbances. The theory is to encourage the overworked glands and to reestablish their normal functional activities. This treatment is of no use in tinnitus due to otosclerosis or to labyrinth or auditory nerve lesions, or to faulty nerve centres.

In conclusion, the possibility of not having persevered long enough should be taken into consideration as a factor in accounting for those cases in which there was no improvement with this treatment.

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Progressive Systemic Deafness as an Endocrine Syndrome*

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According to present teaching, patients with progressive deafness and tinnitus are to be placed in one of three categories, chronic catarrhal otitis media, otosclerosis, and nerve deafness. Briefly, these conditions may be defined as follows:

Chronic catarrhal otitis media is that condition in which there is an increase in the time of bone conduction of sound and a decrease in air conduction, a raising of the lower tone limit, and increasing deafness. Tinnitus aurium may or may not be present. Otosclerosis is characterized by advancing deafness, extreme tinnitus, a wide open Eustachian tube, no change in the drum membrane, absence of secretion in the external auditory canal. Paracusis is usually but not necessarily present. In nerve deafness the upper and lower tone limits are narrowed, the relationship between bone and air conduction is not at all or only slightly altered, and there is progressive deafness, usually rapid.

The term otitis media, as applied to these conditions, is open to serious objection. It supposes two wrong inferences. One is that the condition is primarily a local change, and the other that it is inflammatory in nature. The condition is really the local manifestation of a systemic disturbance, and the change is partly infiltrative and partly a lack of tone, or relaxation due to degenerative changes, in tissues with a purely mechanical function. In some cases the infiltrations and in others the relaxation will predominate in the local changes.

The use of the term otosclerosis to separate the terminal stage of a case of progressive systemic deafness from its earlier manifestations is not justified. In this particular instance the disease has commenced in early life, usually at puberty or adolescence, before ossification is complete, and the course of the disease has been a stormy, rapidly progressive one. The term nerve deafness similarly separates off the group of cases of progressive systemic deafness in which the infiltrations and degenerations are mainly in the nervous mechanism concerned in the act of hearing. In each case, there seems little justification for creating separate entities for the conditions. Attributing them to a systemic disturbance based on a pluriglandular dyscrasia correlates the symptoms in a rational way, making their etiology definite and concrete, and puts their treatment on a physiological basis. The systemic evidence of this pluriglandular dysfunction accompanying progressive deafness, whether in a causal relationship or not, is present in all the tissues and organs of the body. This includes the blood and vascular system, the skin and its appendages, the digestive tract, the nervous system and the genitourinary system. In many instances the changes in other parts of the body are more marked than in the ears themselves.

The general aspect of these patients is that of age.

This may be in actual years, or they may be aged beyond their years. This is particularly true when the condition is encountered in early middle life. The hair is gray beyond their years, is dry, lustreless, and may be falling out. The skin is wrinkled and dry and chaps easily. The eyes are dull and expressionless. The glandular secretions generally, so far as can be observed, are disturbed and less abundant. These patients are overdressed for warmth, even in summertime, and they stand winter weather badly. Mentally, they are apathetic and lack interest. They are rarely in a hurry, tire easily, and sleep badly, and yet may be drowsy during the day, especially after a heavy meal. Constipation is nearly always complained of, and in women, there are menstrual disturbances. Generally, they appear to lack the thing we call "pep." Their energy is at a low ebb.

Blood and vascular system.—The cardiovascular system usually lacks tone. The blood pressure varies, but is inclined to be low in uncomplicated cases. It is not unusual to find it between 100 and 115 millimetres, and it may be below these figures. The pulse pressure varies and is not constant, but is more inclined to be low than high. Sometimes the blood pressure is high. This has been encountered three times in the series of cases studied, twice in the female and once in the male, and has been associated with the menopause period in all cases, occurring during the change or after it is complete. It is of the type spoken of as functional high blood pressure, and there is no reason why conditions other than the menopause should not bring it on. Arteriosclerosis does not seem to be present in many of the patients treated for progressive systemic deafness. The pulse is sometimes slow and the temperature below normal. These patients may complain of cold hands and feet, and they stand the cold badly. The lack of pressure, the anemia, and the infiltrations in the skin prevent proper warming and nourishing of the extremities.

The skin and its appendages.—The glands of the skin, sebaceous, ceruminous and sweat, are suppressed or sluggish in their action. As a result, the skin is dry and the patient perspires but little. There is, in advanced cases, a lessening of the cerumen in the external auditory canal. These patients come into the office or clinic on warm days with heavy clothing on, and yet there is no evidence of perspiration. The skin is frequently loose and flabby in texture and not healthy in appearance. Sometimes there is excessive subcutaneous fat, and the skin may then assume a myxedematous hue. The hair is inclined to be dry and brittle and is usually falling out. When the thinning of the hair is far enough advanced to be noticeable, it is most advanced at the hair margins. The hair over the forehead has receded, and at a later time the other hair margins may show the change. The hair and beard lose their pigment and turn gray. This gray-

ness is usually more advanced than the years of the patient would indicate. The eyebrows are inclined to be thin, especially at the outer third, where the absence is very marked. This thinness of the eyebrows may have always been present, or the eyebrows may be falling out. The body hair is usually scant in the male.

The teeth are nearly always decayed. It is a common remark in the clinic that these deaf patients do not come for treatment until they have paid all their money to the dentist. The reason for this lies in the fact that the decay of the teeth antedates the onset of deafness. The decay attacks both crowns and roots of the teeth, but the crowns seem to suffer most, as the roots are frequently retained. Apical abscesses are common, both in these retained roots and in apparently healthy teeth. There are exceptions to this observation that the teeth are decayed, but this class with good teeth are rare and are in a group by themselves. They are mentioned here only to exclude them from the general class under discussion. There is a tendency for the teeth to be crowded, if enough of them are still present to judge on this point. In addition to the decay of the teeth, many of these patients also suffer from pyorrhœa alveolaris. This is not so universal, however, as the early decay of the teeth. The gums may be receding, or they may be red and inflamed and at the level of the dental interstices continued in polypoid prolongations.

Gastrointestinal tract.—Constipation is the rule. A large proportion of the patients with progressive systemic deafness are so habitually constipated that they have already adopted some favorite method of caring for the condition. The constipation is due to a lack of tone in the intestinal wall, together with a lack of the proper quantity of the secretion of the intestinal and adjacent glands—succus entericus, bile and pancreatic secretion. There is, with this lack of tone of the intestinal wall, an enteroptosis and the intestinal loops lie low in the abdominal cavity. A general ptosis of the abdominal contents may be present. There is, accompanying the constipation, proteid decomposition and toxic absorption from the intestinal tract. The most important of these toxic substances are the amino acids.

Genital system.—In women the menstrual cycle is generally out of order. The disturbance may be irregularity as to time, but seems to be more often than otherwise a reduction in the amount of the menstrual flow. This reduction, when not amounting to complete amenorrhœa, may require careful questioning to bring out the fact. Each woman seems to think, if there is no excessive departure from the normal, that her menstrual condition represents that normal. I recently had a patient assure me that her menstrual cycle was quite all right, and yet on questioning she admitted that she only used two napkins for her whole menstrual period. Menstrual backache may be complained of when there is no abnormality in the uterus. It is due to infiltration and toxic degeneration in the sacrolumbar and coccygeal joints. In men the sexual measure is more difficult to obtain, as there is no specific act by which it may be judged. I am, however, under

the impression that there is some suppression of the sexual vigor.

Bones and ligaments.—There is some increase in the elimination of both calcium and phosphorus in the urine, an increase greater than any change in the temporal bone can account for. The pathological discussions on the bone changes in the various stages of progressive deafness fail to compare the temporal bone changes with those in other parts of the body. There are undoubtedly changes in the temporal bone in the way of faulty deposition and absorption of calcium and phosphorus. But whether there is a general change in the bony framework of the body has not been determined, except as may be anticipated from the amount of calcium and phosphorus eliminated in the urine. As the bony metabolism of the body is under unit control through the blood, with some influence from the trophic nerves, there is every reason to think the bone changes are universal. This would account for the blood calcium changes observed in the advanced cases that have come to be called otosclerosis. These changes consist in faulty deposition and absorption of bone salts, with a cellular infiltration in the Haversian canals and along the vascular spaces.

As to the ligaments, there is no doubt as to their undergoing certain changes. There is a general lack of tone, in the ear as well as throughout the body. If the condition had its inception in early life, these patients may be of the double jointed class. If the inception was in later life, the change will consist in infiltration and thickening. That there is a tendency for the ligaments to relax under strain is evidenced by the number of these patients who suffer from flat feet of varying grades. This lack of tone in the connective tissues generally is to be expected from the pathological changes present in the glandular dyscrasias responsible. It also explains the relaxation of the drum membrane.

The nervous system.—The memory is frequently bad in these patients. They are not mentally active, and lack concentration and mental persistence, and the disposition may be irritable. They have such a list of ailments that it is frequently difficult to control them in history taking, once they are launched on a full recital of their bodily ills. Some of them are phlegmatic, but the rule is for them to assure you that they are very nervous, and this covers a large variety of indefinite conditions. These patients are frequently classed as neurotics and no attention paid to the story of their ailments. They are slow in their responses, mentally and physically. In applying the hearing tests they reply with the utmost deliberation, even when they hear the given sound well, and they use the same deliberation for physical movements during the course of the treatment.

These patients come to the otologist complaining of progressive deafness and head noises, one or both. There is no constant quantitative relationship between these two symptoms. The deafness may be extreme and no head noises present, or the tinnitus may be almost unbearable with a very slight depression in the acuity of hearing. On examination the changes in the drum membrane and

in the middle ear are equally inconstant. The drum membrane may show extreme retraction with full acuity of hearing, or the drum may be in its normal position, with advanced deafness. Likewise the drum membrane may be very thick or very thin, with no quantitative relationship to the symptoms of which the patient complains. In the same way, the relationship between the condition of the drum membrane and the Eustachian tube is equally inconstant. The drum may be retracted and yet the Eustachian tube, on inflation, seem to be wide open. On the other hand, the Eustachian tube is sometimes found well closed by the swelling of the mucous membrane, and yet the drum is but little retracted. To put this in the form of a practical statement, the local speculum examination helps but little in making a diagnosis. The functional examination of the ear throws more light on the condition with which we are dealing, and yet the picture is inconstant—hence the varying diagnosis of chronic catarrhal otitis media, otosclerosis and nerve deafness. There is, however, a fairly constant relationship between the length of time the condition has been present, the severity it exhibits, and the functional examination. There is present both a disturbance of the transference or conduction of the sound waves and a failure of the sounds to register—a dulling of the perception apparatus. These symptoms, the changes in bone and air conduction, and nerve perception are too well known to require discussion here.

I should like to add emphasis to one condition that, it seems to me, the textbooks on otology do not sufficiently stress, that is, the qualitative failure of sounds to register in the higher cerebral centres. There is a full registration of sound volume, but the qualitative analysis necessary to translate these sounds into spoken words is absent. The selective apparatus in the cochlea or hearing centres in the cerebrum do not register properly, and the noise is not appreciated as a spoken word. These patients with progressive deafness will nearly always tell you that they hear your voice, but that they do not know what you are saying. Another way in which this failure of sound registration manifests itself is in the very early stages of a case of progressive systemic deafness. At from three to five feet distant the patient will begin to miscall a greater or less number of the words spoken to him, and at the full distance of twenty feet he is repeating the same number of words correctly. His sound registering apparatus is interfered with, rather than his noise perception apparatus. In life this patient hears part and guesses part, and is credited with inattention. This failure of registration is not true of individuals with average hearing. At the end of their hearing distance for a whispered voice they simply cease hearing a sound. As long as they hear a sound, it registers as a definite word or noise or musical note. The sound registering faculty is in full working order.

Some of these patients show an extreme relaxation of the drum membrane, particularly in its larger, posterior segment. When examined with the pneumatic otoscope the excursions are extreme and the drum appears thin, dry and atrophic. It is so relaxed that it does not seem possible for it to be

regenerated into a tense, vibrating structure. This condition of the drum membrane is not important from a diagnostic viewpoint, as the diagnosis must be made from a functional examination of the ear and a physical examination of the patient. It has, however, extreme importance from the viewpoint of prognosis, as will be pointed out later.

The three periods of life at which progressive deafness most commonly has its onset, are at the crises of life—puberty, adolescence and the menopause, and to this may be added a fourth critical period, the oncoming of actual old age. The severest cases of progressive systemic deafness, the group that supplies the largest number of cases of so-called otosclerosis in later life, are those having their inception at puberty and adolescence in girls. These are the most trying times in their lives, the times of the greatest physical and mental stress, and their ears suffer. In this connection, it must be remembered that the male goes through the same physiological crises as the female, but as the crisis is less marked, so the ears suffer less. In connection with the onset of deafness at puberty and adolescence, it is to be remembered that ossification is still incomplete, and the result of loss of control of phosphorus and calcium is more destructive and lasting in its results than at a later time in life, when the ossifications are complete. Closely allied with the sexual crises of life as a cause of the onset of deafness is the effect of pregnancy. Many women will state that their deafness had its onset or was made worse during the progress of pregnancy.

Next in importance as a cause of the onset of progressive systemic deafness, after the crises of life, is to be put down to worry and shock. This worry may be over finances, over one's own health or the health of near friends, or any of the numerous things humanity is given to worrying over. It may owe its inception to a sudden shock or fright. I have one patient, a woman over sixty years of age, who has been through a trying personal illness, and whose husband has had one stroke of apoplexy. She was making excellent progress when the husband suffered a second stroke and for a time his life was despaired of. About the time that the husband seemed to be out of immediate danger, a sister seventy years old came to visit her and was taken down with neuritis and had to be cared for. Under this strain of worry and fatigue, my patient's hearing receded very markedly, and it is difficult at this time to hold the gain so far secured.

The onset of progressive deafness may also follow a severe illness. This is more likely to be the result of a toxic condition, such as influenza, or a long continued chronic illness of an exhaustive nature. On the other hand, the onset may be insidious and without discoverable cause. Patients will come with the first complaint that they are unable to hear the telephone with one or the other ear, and examination will show an advanced state of deafness in that ear, and perhaps a beginning involvement of the other ear, or the patient's friends may be the first to complain of the onset of deafness. Sometimes these patients cannot fix within considerable limits the time within which

they began to be bothered with head noises and deafness, although they fix the onset of tinnitus with much more definiteness than they do the onset of the progressive deafness. It does not seem to be established that there is any connection between mild inflammatory conditions in the ear and the progressive deafness. The two conditions are more likely to be coincident than to bear a causal relationship one to the other. One condition is purely inflammatory, the other infiltrative and degenerative in nature.

In the present state of our knowledge, it is not possible to say with certainty which of the glands of internal secretion are involved in progressive systemic deafness. Yet from the known pathology and symptomatology, it is possible to mention some of the glands that are responsible for this syndrome. These include, first, that group of glands involved in the control of calcium and phosphorus metabolism, that is, in the control of bony metabolism; second, there are involved the group of glands concerned in the control of oxidation in the body. These two groups really can be combined into one great group which controls bodily metabolism.

The first and most important of these is the thyroid gland. This gland of internal secretion has a definite control over the oxidations and metabolic activities of every cell in the body. It also exercises a special control over calcium and phosphorus metabolism. But, combined with it in this control of the cellular metabolic activities of the body are the interstitial cells of the sex glands. That the internal secretion of the interstitial cells of the sex glands influences bony metabolism is amply evidenced by the differences in the bones of castrated and noncastrated animals. This control of the interstitial cells of the sex glands over bony metabolism may be limited to the shape of the bones, or it may be extended to the metabolism of calcium and phosphorus directly. In the gross, this change is limited to the fact that the bones of the castrated animals are longer and more slender. The castrated animal also suffers a fatty degeneration of his other tissues, particularly the muscular. As a consequence, the muscular and connective tissues suffer from a lack of tone. That castration produces a profound change in the bodily metabolism of an animal is amply evidenced by the difference in the edibility of the flesh of the two animals. That this change in metabolism extends to the nervous tissues, witness the psychic difference.

In those patients who suffer from a lack of vascular tone and fatigability, there is also a probable involvement of the suprarenal gland, as it is a part of the function of the suprarenals to watch over vascular tone and relieve fatigue. It is also probable that the suprarenals join with the interstitial cells of the sex glands in keeping up the tone of other tissues of the body, as witness the extreme asthenia in cases of adrenal involvement, of which Addison's disease is the best known example. In some cases the pituitary gland seems to have some influence on bony metabolism in a way which is not easy to explain, and in regard to which there is a wide difference of opinion.

In any discussion of the glands involved in these

cases of progressive systemic deafness, it seems worth while to call attention to a condition that is sometimes met in connection with this disturbance. I refer to the condition of postmenopausal or functional high blood pressure, which follows the loss of a part or all of the internal secretion of the ovary at the time of the menopause.

In the control of calcium and phosphorus metabolism in the body, the parathyroid and thymus glands are both said to play a part. This, however, is not well enough understood at the present time to justify any positive statements as to their use in the condition under discussion. When the physiology of these two glands is better understood, they may come to play a part in the therapeutics of progressive systemic deafness. It seems desirable, in the discussion at the present time, to stick to facts that seem to be well established.

THE ROLE OF HEREDITY.

It has been quite well established that what is commonly called heredity plays a part in the etiology of progressive deafness. In any discussion of heredity, it becomes necessary to distinguish between true heredity and the intrauterine acquirement of subnormal conditions. In view of the strong tendency for the offspring to be an anatomical copy of the parent, it seems entirely possible for a tendency toward a weakened or subnormal glandular system to be transmitted by true inheritance, and this undoubtedly does occur. However, the great mass of so-called inheritance must be credited to intrauterine acquirement. A woman with a thyroid gland just sufficient or not quite sufficient for her needs becomes pregnant. The pregnancy immediately throws an added burden on her thyroid gland and causes its hypertrophy. As the intrauterine development of the child progresses, she must not only supply thyroid gland substance for herself, but also for the child. If there is less thyroid substance than is required for the development of the child along proper lines, then its thyroid will be subnormal, and later in life will fail to function properly, and will not stimulate the other glands, particularly the sex glands, to a proper development. As a consequence that individual must go through life subnormal in so far as his glands of internal secretion are concerned.

Breast fed babies receive the necessary amount of thyroid substance through the mother's milk, and this in turn stimulates the thyroid gland to a proper development. Bottle fed babies, on the other hand, do not get an adequate supply of thyroid secretion in cow's milk, and this lack may not only prevent proper bodily development but may also lead to a thyroid gland that is inadequate to the needs of the body.

PATHOLOGY OF PROGRESSIVE SYSTEMIC DEAFNESS.

Keeping in mind the pathology of minor thyroid deficiency and also the pathology of sex gland loss, we are now in a position to reconcile the pathology and symptoms of the local ear condition, and to state the pathology in the light of the etiology and symptoms. As I have previously pointed out (1) the pathology of minor thyroid dyscrasia is essentially that of the so-called cellular infiltration. The

older, worn out cells of the tissues are not destroyed, and the new cells are not adequately formed. This leaves an excessive number of cells, with crowding, in the tissues, and the condition is spoken of as infiltration, although this is not a good term. Sub-oxidation would more correctly describe the condition present. With this infiltration, there is a condition of myxedematous degeneration, which is mild or grave in direct proportion to the disturbance of function of the thyroid gland. As I have already said, the pathology of gonadal or sex gland deficiency is that of a mild fatty degeneration, with bone changes that are undoubted but not so well understood. An extreme example of the bony change of sex cell origin is the osteomalacia occurring in poorly nourished women after repeated pregnancies.

Now combining this into a coherent picture, we have that of infiltration and cell crowding, with mild myxedematous and fatty degeneration. As a result of this cell crowding and degeneration, there is poor local circulation and further depression of metabolism. With this, because of the faulty action of the two glands, there are changes in the phosphorus and calcium metabolism. In addition, there is increased cellularity in the vascular and Haversian spaces of the bone. Later, in the stage of atrophy, there may be absorption and contraction of the cellular elements, and a condition of osteoporosis supervenes.

Now to apply this pathology to the local condition under discussion. It is possible that in those cases of thyroid and sex gland insufficiency that give ear symptoms, the bone changes already described are more marked in the temporal bone than generally throughout the body, because of some local predisposing factor. The first change is that of infiltration and thickening in the drum membrane and throughout the middle ear and its connections. At a later time, there will be a stage of atrophy. As a result, the connective tissues of the middle ear, including that of the drum, will be of low tone and so will lack vibrating tension. The muscles will lack tone, and these should, under careful examination, show some evidence of fatty infiltration, as should also the ligaments of the ossicles. The connective tissues of the labyrinth and cochlea are also of low tone and lack resilience, and this will, in part, account for the failure of sounds to register that has already been spoken of under symptomatology.

It is, however, in the nervous element of hearing that the most profound results of the infiltration and degeneration are shown. The nervous tissues are the most delicate in their adjustments. They do the most work, as judged by oxidations, use up the most energy, have the least reserve store of oxidizable material, and suffer the most profound effects from slight causes of any tissue in the body. The nervous structures suffer the same infiltration and fatty degeneration that is present in other tissues of the body. This extends from the end organ in the cochlea, through the cochlear branch of the eighth nerve, and on into the perception and interpretation apparatus in the cerebrum. The threshold stimulus is dulled all along the pathway. The end organs in the cochlea are less responsive, the transmission is less free, and the registration in the cerebrum is interfered with. Those cases showing the

late effects on the nervous apparatus are classed as nerve deafness, while at an advanced stage, when the atrophic end results are present in the middle ear and temporal bone and the cochlea, come to be called otosclerosis, particularly if the course has been a stormy one.

TREATMENT OF PROGRESSIVE SYSTEMIC DEAFNESS.

The inflation of these patients is to be wholly condemned. The drum membrane, the ligaments of the ossicles and the middle ear muscles are already below normal as to their tone and beginning to relax, and inflation detracts from the tone they have left. These structures are not accustomed to carrying a load of tension, as there is, under normal conditions, no appreciable condensation of the air in the middle ear. Even in proper blowing of the nose the pressure within the middle ear is not increased, the Eustachian tubes remaining closed. Tissues that will lose tone and relax practically under their own weight are certainly not prepared to resist and will not resist the traumatism of a vigorous inflation.

Infected adenoids and tonsils must be removed and abscessed and decaying teeth must be cared for as a part of the treatment. These infections all throw an increased load of detoxication on the glands of internal secretion and render their action less efficient. In instituting endocrine treatment of progressive systemic deafness the glands concerned must be freed from as great a load of detoxication as may be, and in so far as possible, permitted to function normally. In pursuing this object, all local infections must be removed. To secure the best results, however, from the administration of endocrines the treatment must be instituted at the earliest possible moment. There will come a time when the degenerative changes have reached such a stage that restoration of function is not possible, and when there may be an organic destruction of nerve endings in the cochlea, or an atrophic degeneration of the organ of Corti, and similar conditions.

I should like to preface the discussion of the endocrine treatment of progressive systemic deafness with the statement and caution that no one should make a serious attempt at endocrine treatment unless he has made a study of the principles of treatment and physiology from the viewpoint of the glands of internal secretion. The administration of endocrines is not entirely without danger, and should not be undertaken lightly. There is no routine treatment, and simply because I have secured good results in a given case from a certain capsule is no justification for the routine use of that capsule. There is and must be an individualization in each patient treated. For now, more than ever, we are treating a patient and not a case.

With these reservations, I may be permitted to state that I have treated many of my patients with an adrenospermin compound. These are the so-called thyroid type of patients. If the patient presents both pituitary and thyroid symptoms, then I am accustomed to begin with a mixed gland substance. It is to be remembered that it is necessary to prescribe stock formulas in endocrine treatment. The gland substance must be at once made up into a capsule or tablet that will protect it

from oxidation, and prevent deterioration. For this reason, it is not possible to write prescriptions for the druggist to prepare. With functional high blood pressure, as in postmenopausal conditions, the situation to be met becomes complicated. Here we have an overactivity of the adrenals with a depression of the sex gland function. The result is that the adrenals lack control. For the relief of the high blood pressure a number of endocrines have proved useful, and among these, sex gland substance is of the most importance in the present discussion. Pancreas substance is a direct antagonist of the adrenals, and so is efficient in some of these cases in reducing blood pressure. Bandler recommends placental substance very highly for the reduction of postmenopausal high blood pressure. In a similar way other conditions must be met as they arise. The blood pressure seems to be the key to the control of the treatment. If the pressure is low, adrenal substance is to be included in the treatment. If the pressure is normal or high, then the treatment will consist of a combination of thyroid and sex gland substance, the proportion of sex gland being increased as the blood pressure increases. The doses must be kept small, as the administration will of necessity extend over a long time. The initial dose of thyroid substance should not be more than one eighth of a grain, usually less.

As to the permanency of the improvement, it will require many years to arrive at a final conclusion on this point. It will very naturally suggest itself that the permanency of the improvement will of necessity depend on the amount of suppression of the physiological activity of the glands affected. If, in the individual, there was a normally acting set of

endocrine glands present, and their secretions have been reduced by a severe fright or shock or, toxic illness, then the gland or glands involved may be restored to normal and the treatment discontinued. On the other hand, if there is a permanent subnormal condition of the patient's endocrine system, and this cannot be brought up to the point where it will meet the requirements of the patient's bodily activity, then that patient will, of necessity, have to be under more or less continuous treatment. He will, however, learn to judge of his condition more accurately than any physician could judge of it and will be able to take his necessary minimum of endocrine substance, subject to some guidance from the physician.

In these patients, where the administration of endocrines is likely to continue for a considerable time, their administration must not be continuous. This must be intermittent for a week or ten days in each month, and in women this period should begin a few days before menstruation sets in and continue for a few days after it has ceased. Occasionally, in those patients in whom the preservation of the hearing necessitates the continued administration of endocrine substance, there should be intermissions extending over one or two months, or even for longer periods, if the gland deficiency present will permit it.¹

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¹ The conclusions drawn will appear in the author's reprints.

The Effect of Pituitary Extract on the Rate of Urine Formation in Man

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It was at the suggestion of my former professor, Dr. A. N. Richards, who holds the chair of pharmacology and pharmacodynamics in the Medical School of the University of Pennsylvania, that this study was undertaken. The infectious enthusiasm, kind encouragement and stimulating influence of Dr. William deB. MacNider, professor of pharmacology, University of North Carolina Medical School, have also aided me valuably during this investigation. Therefore, to these two men, as well as to my father, Dr. L. B. McBrayer, who ably and tirelessly assisted me in the actual work, I am deeply indebted.

Before taking up the actual work of which this paper is the subject, let us briefly review the current teaching of the pharmacology of pituitary extract. Here we may state that the preparation used in this study is the obstetrical pituitrin made by a reliable drug house, which, in a recent personal communication, states that this product is a quantitatively

standardized aqueous extract of the infundibular portion of the pituitary gland, and that obstetrical pituitrin is just one half as concentrated as surgical pituitrin. This product was used because we believe with Rowntree (1) that for such studies it is probably the best preparation available.

The manufacturers' statements concerning the pharmacological action of this preparation agree with the statement in that admitted authority (2) which says that "when the extract is injected intravenously, the blood pressure rises"; that this "rise in pressure is due to the constriction of the peripheral arterioles, as is shown by the lessened volume of the organs." He concludes that "the pituitary substance must act directly on the muscle fibre," because this action is not interfered with by severing the vasoconstrictor nerves or by paralyzing the myoneural junctions with ergotoxin. However, this constrictor action on the arterioles seems not to be

without exception, for the same writer finds that "one of the earliest observations was that pituitary extract injection was followed by a profuse secretion of urine, generally accompanied by dilatation of the renal vessels and an increase in the volume of the kidney," although there is some conflicting evidence to prove that this is the complete *modus operandi* in the diuresis. Cushny's statements are arrived at by reasoning from analogy, in that they are mainly based on animal experimentation. Norris states practically the same thing: "It (pituitary extract) also has a diuretic effect due to direct stimulation of the renal cells, usually aided probably by a concomitant vasodilatation, because there is no constant relation between pituitrin diuresis and either systolic or pulse pressure or the ratio between them."

Realizing that a textbook can hardly be out of the hands of the printer before subsequent studies have antiquated parts of it, we communicated with fifteen

unpublished experiments, that "the rise in systemic blood pressure which follows the use of pituitary extract and the associated vasodilatation of the renal vessels is not the essential elements in pituitary diuresis. The rise in systemic pressure and the renal vasodilatation favor diuresis from pituitary extract, but if the renal epithelium is injured by an anesthetic or by uranium nitrate no diuretic effect is obtained from pituitary extract, even though the general and local circulation is favorably influenced for diuresis. The primary and essential element in pituitary diuresis is its ability to stimulate renal epithelium."

Certainly you will agree that the current and generalized teaching on this subject is that pituitary extract is a diuretic for man, although in 1915 Korschegg and Schucter (4) reported that, in normal persons, the volume output of fluid and solids could be lessened for sixteen hours by the subcu-

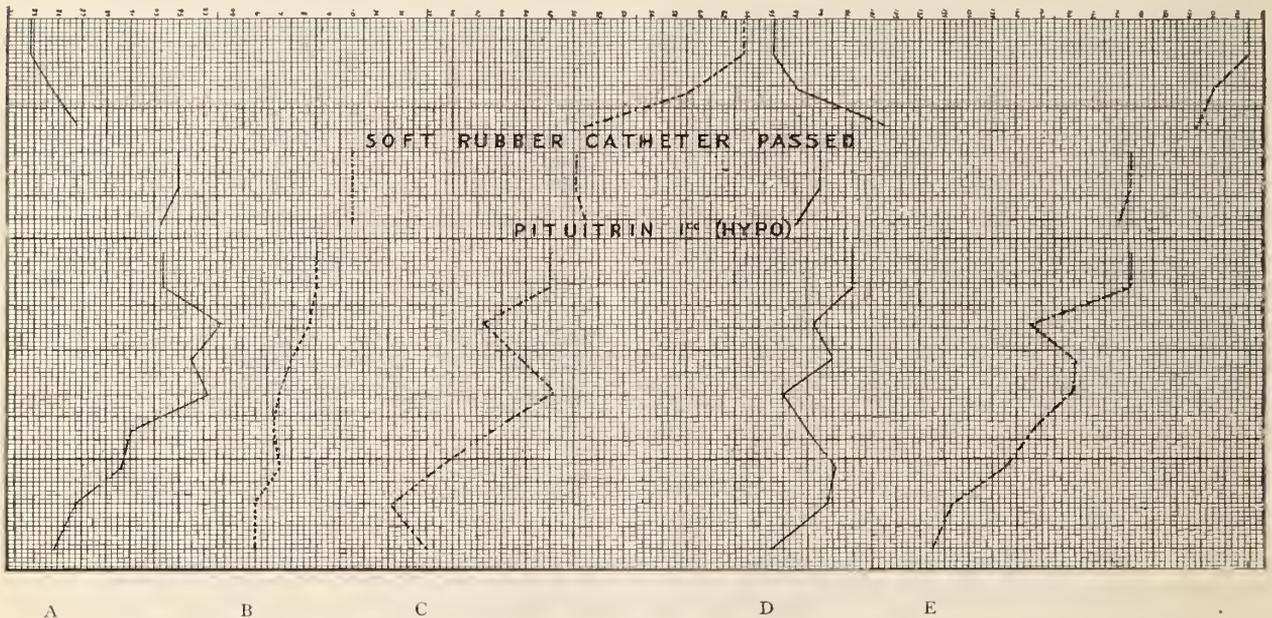


FIG. 1.—North Carolina Sanatorium weight chart. A, shows pulse rate; B, urine flow; C, pulse pressure; D, diastolic blood pressure; E, systolic blood pressure.

of the best medical schools in the United States, requesting the professors of pharmacology to give us their current teaching on the pharmacological action of pituitary extract with reference to urine formation. To date, Columbia University, Johns Hopkins, University of Michigan, University of Virginia, Washington University, Yale University, Cornell University, University of Chicago, Tulane University, University of North Carolina and the University of Pennsylvania have replied.

To crystallize their replies, they would be as follows:

The subject is yet too undeveloped to permit of dogmatic teaching; however, we superficially mention its diuretic effect, using Cushny's textbook as the basis for this teaching, or, as a few did, entirely avoid answering the question.

MacNider, referred to above, than whom there is no greater authority on the kidney, considers, in a personal communication to us based on

taneous injection of one to two c. c. of pituitary extract.

TECHNIC OF EXPERIMENT.

Our study was undertaken in the following manner: The seven subjects used were patients in the North Carolina Sanatorium, undergoing treatment for active pulmonary tuberculosis. In a warm room, free from noise, interruptions and drafts, each of the seven ambulatory males was singly placed at complete and comfortable rest in a semi-sitting posture on a standard recliner. His position and clothes were adjusted for subsequent catheterization to the point that this operation did not require a single movement on his part. After the subject had rested for fifteen minutes, the five and one half inch cuff of the Faught mercury sphygmomanometer was applied to his right arm, and the systolic and diastolic blood pressure and the pulse rate (counted in half minutes) were recorded at regular intervals—usually two minutes—until it appeared that each

had reached a constant level or rate. This required about twenty-five minutes. The subject was now catheterized with a soft, medium sized rubber catheter. This was done with the minimum of confusion, noise and movement on the operator's part, and with the least possible discomfort to the patient. When the bladder had been emptied and a constant dropping of urine from the catheter had been established, the amount of urine flow per unit of time (usually two minutes) was measured. This, in our opinion, was taking the urine from the bladder at the rate at which it flowed into the bladder from the kidneys. Along with this measured urine flow, the systolic and diastolic blood pressure, and the pulse rate were taken and recorded as detailed above. The four readings were regularly continued until each became practically constant, which required about thirty-five minutes. One cubic centimetre of pituitrin was now given subcutaneously in the left deltoid region. This was done with the least possible disturbance to the patient, blood pressure cuff and catheter. Immediately the readings of the systolic and diastolic blood pressure, the pulse rate and amount of urine flow per unit of time were regularly continued and recorded. This procedure was usually continued for an hour after the administration of pituitrin.

Now let us take up the results obtained in each case.

Note: The total solid estimations referred to below were obtained by that old and often proved rule (5) which has us multiply the last two figures of the specific gravity by two, the product being the total solid output in milligrams per thousand c. c. of said urine. We realize that this method is not truly scientific and accurate; nevertheless, it was the only available method possible.

CASE 2003.—E. B. S., aged twenty-six years. Classification: far advanced, B. No. 3. Three urinalyses showed: tubercle bacilli, white blood cells (mainly small lymphocytes), pus cells (few). Phenolsulphonephthalein output: two hours, 65 per cent.; three hours, 72 per cent. His urine output was studied, as above outlined, for an hour and eighteen minutes, with the following results: The rate of urine flow averaged 1.25 c. c. per minute for the fourteen minutes just preceding the administration of pituitary extract. During the first thirty-two minutes immediately following the extract, it flowed at the rate of 0.992 c. c. per minute, which was a twenty-one per cent. decrease in output per minute. During the next thirty-two minutes it flowed at the rate of 0.8 c. c. per minute, which is a thirty-six per cent. decrease. The output of solids during the fourteen minutes before the drug was at the rate of 0.05 mg. per minute; while, during the first thirty-two minutes following the drug, the solid output was 0.0396 mg., or a decrease of twenty and eight tenths per cent. per minute. The output of solids for the second thirty-two minutes was at the rate of 0.032 mg. per minute, or a decrease of drug was 1.020, as was the specimen following the drug.

CASE 1852.—J. W. W., aged twenty-nine years. Classification: incipient, A No. 1. Urinalysis, based on two examinations, showed a trace of albu-

min, occasional hyaline and granular casts, specific gravity 1.034. Phenolsulphonephthalein output: two hours, 45 per cent.; three hours, 55 per cent. Urine output studied as above for one hour and twenty-one minutes. Average rate of urine flow, during the twenty minutes preceding drug, was 2.3125 c. c. per minute; during the first thirty-one minutes following the drug it was 0.9322+ c. c. per minute, or a decrease of sixty per cent. During the next thirty minutes the rate of flow was 0.7066 c. c. per minute, or a decrease of sixty per cent. No estimation of solids or specific gravity readings were done in this case.

CASE 1840.—W. S. M., aged thirty-two. Classification: incipient, A No. 1. Two urinalyses showed: Albumin plus; occasional white blood cells. Phenolsulphonephthalein output: two hours, 41 per cent.; three hours, 55 per cent. Urine flow was studied, as above, for one hour and forty-seven and five tenths minutes. During thirty-one minutes prior to drug, average rate of flow was 0.9677+ c. c. per minute. During first thirty-six and five tenths minutes following administration of drug, the average rate was 0.8219+ c. c. per minute, or a decrease of seventeen per cent. per minute. During the next forty minutes, the average rate of flow was 0.75 c. c. per minute, or a decrease of twenty-three per cent. No estimation of solids or specific gravity readings were made.

Realizing that this series of studies is numerically small; knowing, however, that the facts were obtained in a very detailed and accurate manner, and furthermore appreciating the utmost consistency in the results, we feel that the following conclusions are warranted:

1. During the first hour following the hypodermic injection of medicinal doses of pituitary extract, the urine output is markedly decreased.
2. During the same period of time the total output of urinary solids is markedly decreased, both relatively and actually.
3. During the same period of time there is a marked and constant decrease in the systolic, diastolic and pulse pressures, and pulse rate, which decreases appear definitely related to the decrease in the fluid and solid output of the urine.

Realizing that this decrease in the output of urine and urinary solids might be only a temporary affair, we undertook the study of these two problems in fractional twenty-four hour specimens. We regret to state that our series of cases is yet too small and the data obtained too inconsistent to permit of any conclusions.¹

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¹ Additional Cases 2021, 2027, 1902, and 2038 will appear in the author's reprints.

Editorial Articles

PRACTICAL ENDOCRINOLOGY

Some of our less progressive coworkers seem concerned lest we desert the old standbys of medicine and get lost chasing a will o' the wisp—endocrinology. This warning would have its value if things were as they say they are instead of being as they are. If the modern endocrinologist worked with test tubes; if he neglected to consider his patient as an integrated organism; if he asserted that endocrinology was an open sesame to the cure of all diseases and deformities, the warning would be justified. But for the present we are little concerned about the omens predicted. Endocrinology is making rapid strides, not so much from a therapeutic point of view but from the viewpoint of a better understanding of the organism as a whole, of its powers of coordination, of its wonderful powers of direct and indirect compensations, these compensations being most clearly shown in the endocrine chain. No more stimulating field of medical endeavor has been encountered in a long while. The importance of extensive and minute history taking has been emphasized, as has the importance of various markings. Every specialty has been affected. Every branch of medicine and surgery has been influenced by the discoveries of endocrinology. This is not a new subject. Endocrine products have been used empirically for centuries.

The editors of the *NEW YORK MEDICAL JOURNAL* have long since realized the importance of practical endocrinology. For some time past we have collected papers from the most progressive workers in this field, in America and abroad, and have offered them to our readers in the form of special numbers. The present issue of the *JOURNAL* is one of the best we have managed to create. We shall not emphasize the standing of the various workers or the importance of the papers. We can only state that the papers have been selected with great care. Much material is presented that is absolutely new. We feel that every paper is worthy of careful reading by every medical man, no matter what his specialty may be. This cannot be said of an equal number of papers in any other medical journal. Numbers such as this are of more value than an ordinary textbook, a textbook which would cost as much as a year's subscription to this journal. We feel that we are rendering a distinct service to the medical profession in issuing our various special numbers, the most important of these being the endocrinological numbers.

SACROILIAC DISEASE

So many common symptoms, lately classed under a few indefinite titles, have been found to centre causally about an abnormal condition of the sacroiliac joint, that sacroiliac disease, as it has come to be called, seems a new and increasingly frequent affection. The very indefiniteness of the words lumbago and sciatica or crick in the back, tell of the vagueness of pathological knowledge of their cause, but none of these conditions is new and they are probably not much more frequent since they have been traced to their local setting.

That sacroiliac disturbances are not more frequent is to be wondered at when the joint is studied, for probably no structure in the body seems more unfitted for the stress and strain that is thrown upon it. The sacrum is wedged between the ilia with surfaces for articulation well nigh vertical and of only one by three or four inches in size. The ligaments are not heavy and the musculature seems of small moment. For an animal built on the horizontal plane it might be called perfect, for certainly there was no downward pressure upon the wedge, but, when the upright posture was assumed, a weight equal to that of the head, arms and practically all of the trunk—say of a hundred pounds in the average adult—was thrown upon the wedge. When our ambitious ancestors began to throw stones and to wield clubs, the weight of the stone, club, and later of hod, wheelbarrow, bed mattress or what not might suddenly be added to the body weight, while, in the obese, the burden might easily be added to by another hundred pounds.

How marvellously adaptive the joint has been and still is, is shown by the infrequency of symptoms referable to this joint in young people and in those who make a reasonably varied use of it. It is the unusual use or use in the unusual position which finds this structure napping: the school teacher or store clerk attempting to lift a barrow of dirt, or the middleaged gentleman of leisure who throws a stone too violently at neighbor's trespassing chickens, or the woman who has long given the joint the artificial support of a corset and who is taken with a crick in the back as she is getting out of bed. Whether this latter incident ever occurs in those who go uncorseted has probably not been studied but we doubt if it does.

That sacroiliac trouble is especially likely to occur or recur at the menstrual period, leads us to surmise that there is yet much to be learned about the be-

havior of joints. Do ligaments lengthen, does the cartilage become thinner at times, or is the muscular support of this particular joint more important than seems possible?

That the joint is subject to injury of a lasting nature is revealed in the dissecting room, partial or complete ankylosis being found, as well as less significant signs of trouble. A good deal of chronic lame back is doubtless a result of chronic arthritis, the metabolic disturbances following repeated local injury.

Among repeated injuries of a minor kind which must have their effect, the striking of hard heels upon hard pavements must be considered not unimportant, for the sacroiliac joint bears the brunt of the jar. Rubber heels would certainly have some effect as a prophylactic. Correction of faulty feeding must be of benefit to this as to all other joints, while an active use of the joint in a variety of movements is also of general as well as local benefit.

HYDROMINERAL AND CLIMATIC TREATMENT OF RHEUMATISM AND HEPATIC DISEASES

During the past thirty years a great movement has been set on foot, both in Europe and in this country, in favor of utilization of the hydromineral and climatic treatment of chronic affections. It is generally admitted that this method represents one of the most powerful agents in combating affections that are difficult to cure. The nature of the treatment in detail is naturally in the hands of the physicians at the various resorts who have specialized in the matter. The general practitioner cannot be expected to be familiar with the particular properties of the different springs, any more than with the method of applying the balnear and physiotherapeutic measures employed at each resort. However competent a physician may be from the point of view of hydrology he nevertheless hesitates to give advice regarding the choice of a spring or methods of application. Detailed instructions should not be given to any patient as to what he ought to do at any other resort, because he should make it a question of principle to leave this matter to be decided by the local man whose experience has been acquired at the resort. It takes the latter many years of close observation to familiarize himself with the action of different mineral waters, both when imbibed and when used externally.

Naturally at this season of the year physicians are casting about for places to send their patients. If possible they should personally inspect a resort before referring patients, not to be caught by an antique

bathing establishment, with no modern improvements nor efficient service, where a new doctor is hired each year, usually splitting his fee with the bath-house company and obtaining his consultation principally from professional steers who frequent the hotels and parks of the resort with no knowledge whatever of the right prescribing of the waters. The local physicians must stand and take this condition of affairs, and it is no wonder that the physicians who send their patients to such a combination are disappointed in the results when they return.

Then there is another consideration that requires special attention. It is not enough to select a health resort in accordance with the therapeutical indications, we must also as far as possible take into account the economic conditions of the resort. Certain watering places have been organized in view of a rich clientele, while others are accustomed to receive patients of moderate means, although there are some, it is true, provided with hotels of every sort, where the graft is as strong in some instances as the mineral waters supplied. It would therefore be a tactical error to send a wealthy patient to a resort ill provided with the comforts of life, just as it would be to send persons of moderate means to a place where there are only first class hotels. In any event, it would be well for the physician to ascertain conditions carefully before he refers his patients whom he naturally expects to come home improved.

PHYSICIAN AUTHORS: SIR THOMAS BROWNE.

There are few physicians in the seventeenth century who took the pains to acquire as thorough a scientific knowledge of his profession as did Sir Thomas Browne, the famous author of *Religio Medici*. Although he was content to be merely a country physician—with antiquarianism and literature as his hobbies—Sir Thomas was one of the best equipped practitioners of his day.

He was born on October 19, 1605, near London, and after having attended Winchester College and Broadgate Hall (now Pembroke College), he began his medical studies at Oxford University. But the medical course offered at Oxford in those days was exceedingly incomplete. It consisted solely of a little perfunctory reading of Hippocrates and Galen in the original, and even the study of the drugs and plants was of a sketchy character. There was no hospital in connection with the university, and therefore no clinical school. "If Browne went through the poverty stricken classes of Oxford medical teaching," says Edmund Gosse, "it could only have been to assure himself of their worthlessness. His

writings may be searched in vain for the slightest sign of loyalty to Oxford or gratitude for anything she taught him." And so, dissatisfied with the meagre education in medicine offered at Oxford, Browne went to the continent and spent a year at each of the three most famous schools of that day. The first of these was Montpellier—where Rabelais got his medical degrees—where the basal training in the profession was said to be more thorough than anywhere else in the world. Montpellier was the first school to give public demonstrations in anatomy and nowhere else was the new science of botany so thoroughly taught. As an indication of how far the medical science has progressed since that time, it may be mentioned that when Browne was a student at Montpellier the school taught that the life distributed throughout the body was due to an organic soul, the vital principle of which animated the tissues and gave warmth and movement to the body. This was the theory of vitalism which Descartes rejected. The university, after a bitter fight, also rejected the theory a short while later.

After finishing at Montpellier, Browne went on to the University of Padua, then regarded as the centre of the world of science. "It was in Padua," says Gosse, "that for upwards of a century young men from all parts of Europe had received surgical teaching such as could nowhere else be supplied. The school was preeminent in all branches of surgical and anatomical science."

From the University of Padua Browne went to the comparatively new University of Leyden, which had lately developed educational facilities that made it of great importance to students of medicine. Leyden laid emphasis upon the study and development of chemistry, whereas Montpellier and Padua stressed anatomy and surgery. Before Browne left Leyden he received his degree of M. D. and shortly thereafter, probably in the fall of 1633, he returned to England. "Thus he examined all that the fermenting scientific world of France, Italy and Flanders had to offer of what was curious and new," says Gosse. . . . "He was able, without painful effort, to throw off, or to keep from acquiring, the mental prejudices which were typical of the strenuous, straitened English tradition of the early seventeenth century." All of which, to a large extent, accounts for *Religio Medici*.

Upon his return to England Browne settled at Shipden Hall, near Halifax, and began practising, but in 1637 friends induced him to move to the much larger town of Norwich, where, as Charles Whibley tells us, "he spent more than forty years in the tranquil practise of medicine, in the study of antiquities, and in the pursuit of humane letters."

In the year that he went to Norwich he was enrolled as a physician at Oxford and two years earlier he had taken a degree at the London College of Physicians. At Norwich he not only was "much resorted to for his skill in physic" but his home, a "paradise of rarities," became the Mecca of English antiquaries. He took a keen interest in anything and everything of antiquarian nature—urns, coins, bones, eggs, fossils—and was considered an authority on such things, but his writings show him to have been extremely fallible along that line. It is purely for their style that these writings are of any interest today.

Although *Religio Medici* was written before he went to Norwich, and before he was thirty years old, it was not published by its author until 1842, after a highly inaccurate copy of it had fallen into the hands of a piratical publisher. It has survived almost alone among the treatises of the seventeenth century, says Whibley, "because it is set to perfect music, for Sir Thomas Browne was a musician who played upon the instrument of speech with the skill of a conscious artist." Bulwer-Lytton called it "one of the most beautiful prose poems in the language" and Prof. George Saintsbury said that "as an artist, or rather as an architect of words in the composite and florid style, it is vain to look anywhere for his superior." Coleridge called Browne "a writer of great genius" and many other eminent critics have been lavish in their praise. Browne was a disciple of Montaigne, and he, in turn, has had a great influence on later writers, notably Charles Lamb. *Religio Medici* is a treatise on "the religion of a physician." Gosse calls it "a defense of the attitude of a mind that is scientific and yet reverent. The subject of the treatise is religion as it appears . . . to an intellect which for a long time past has been concerned exclusively with natural experiment, and which comes back to religion habituated to the experimental attitude."

Browne's other writings included *Pseudoxia Epidemica*, or *Vulgar Errors*, published in 1646; his volume on *Hydrotaphia*, or *Urn Burial*, published in 1658; *The Garden of Cyrus* and some other works published under the titles of *Certain Miscellany Tracts* in 1684, *Christian Morals* in 1716, and some other writings which were first published in his *Works*, which appeared in 1686, four years after his death.

During the Civil Wars Browne sided with the Royalists and in recognition of this fact he was knighted during a state visit of Charles II to Norwich on September 28, 1671. He died on October 19, 1682, the day on which he completed his seventy-seventh year.

REFORMER OR REALIST.

It is extremely unfortunate that the medical aspects of the venereal diseases and their prophylaxis always have been more or less linked up with and frequently obscured by the moral considerations involved in the subject of prostitution as a social evil. Prostitution always has been regarded the handmaiden of vice and immorality, and therefore legitimately within the purview of moralists, theologians and other types of nonmedical social workers. On the other hand, the venereal diseases, which are to a very large degree the sequelæ of prostitution, are essentially medical in character, and naturally come within the province of the physician. Hence the inevitable conflict of views.

The moralist aims to suppress public prostitution, and believes that this desirable end having been attained, venereal disease and its associated ills would immediately disappear from the face of the earth. As a result, he hails with delight the cleaning up of a redlight district, or the disappearance of the unfortunate soliciting woman from the city's pavements, and when these ends are accomplished he feels that his work has been well done. It is obvious to everyone else, however, that his success lies solely in the suppression of the outward manifestations of the evil, for it is undeniably impossible to control or even influence the practice of hidden or covered prostitution that does not show itself in some form or other. The physician, on the other hand, especially he who sees much of the venereal diseases in his daily practice, is not seriously impressed by these activities. He knows there is little or no perceptible decrease in the amount of venereal disease he is called upon to treat, even after his city or town has been cleaned up and the professional prostitutes have been driven out of the town.

It is not to be wondered at; therefore, that he views the subject of prostitution and its suppression in a light that does not bring joy to the ardent social hygienist, even though he be a strong believer in the evils that go with society's greatest ill. This is made evident by an article which appeared in the *NEW YORK MEDICAL JOURNAL* and an editorial critique on the same which appeared in the *Social Hygiene Bulletin*, June, 1921.

Dr. Abr. L. Wolbarst, of New York, the author of this article, declares that public prostitution in New York City "has been so severely dealt with that it cannot any longer be considered a serious factor in the social life of the community"; but he maintains that while the outward form of prostitution has changed, the substance remains unchanged; that "its manifestations may be suppressed in one direction only to reappear elsewhere

in another form." He ends his article with these conclusions: "I desire to emphasize the belief that the suppression of prostitution has not diminished illicit sexual relations; that it has resulted in widespread moral looseness and sex stimulation; that it has caused the moral and physical ruin of many girls who might otherwise have remained clean and unscathed; and finally, that it has not perceptibly diminished the amount of venereal disease, but on the contrary has caused its dissemination in a wider circle, especially in the poorer strata of society."

The editor of the *Social Hygiene Bulletin* may with propriety express his disagreement with these views; but we feel he has not been justified in his conclusion that the author condones or favors public prostitution, for we have not been able to discover a word or a line in the text of the article or in his conclusions that would justify the insinuation. Yet this is the substance of the editorial criticism above referred to, in which he refers to the author's views as "an exploded argument."

It seems to us the editor has utterly failed to catch the point of Dr. Wolbarst's article. We regard his article as an expression of conditions as they are, and not as he would like them to be. To us the situation is very much the same as that which exists with reference to the subject of prohibition. Prohibition is a law, and the national government and the various states are doing their utmost to enforce it. But where is the man who is foolish enough to say that while he believes in the righteousness of prohibition he is satisfied that prohibition actually is diminishing the amount of alcoholic liquors manufactured and consumed? Even the prohibition officers, whose duty it is to enforce the law, admit that "every little cellar has a still of its own," and that liquor is being manufactured and consumed clandestinely throughout the country in vast amounts, even by people who never tasted alcoholic drinks previously.

Why not look the facts squarely in the face? We do not believe in public prostitution, nevertheless we agree with Dr. Wolbarst in his view that the suppression of public prostitution has brought with it a vast amount of clandestine prostitution and loose living, which is a serious menace to the community, exactly as we believe that the clandestine manufacture and consumption of alcoholic liquors is a greater evil and does more harm to the morale of the community than all the distilleries and breweries ever did.

We feel Dr. Wolbarst has struck the proper note and has performed an actual service to the community in pointing out the hidden dangers of clandestine prostitution, which he traces, more or less

directly, to the suppression of the outward manifestations of public prostitution. Many entertain similar views, but evidently have not the courage to express them.

IS THE GOSSIP INSANE?

Men and women who gossip, said Dr. E. H. Bullock, of Chicago, city health director, cannot be in their right mind, and should be given the closest attention to get them back to normal. They have been called "assassins of character," and E. C. B. Jenkins, a psychologist and secretary to the Board of Police Commissioners, Chicago, says, in *The Detective*, February, 1921, that the neighborhood gossip and the anonymous letter writer have one of the nastiest, lowest and most vicious forms of insanity known to medical circles. Their distorted imagination visualizes scenes which they would have come true, and their insane mind immediately grasps the story and they repeat it as if it were true.

Gossip and anonymous letters are a constant pest at police headquarters, but reports registered with police officers in an attempt to injure character by these means or false telephonic reports are a failure; in fact, the police take more pleasure in tracking the informer than the one informed about.

ELECTROCUTION FOR UTAH.

The desires of Utah murderers will henceforth be limited as to modes of death. The shotgun execution law hitherto gave them the choice between hanging and shooting. When the latter was preferred the law provided five citizens at seventy dollars each. The list at the last execution was greater than at any other, so the Legislature thought it was bad morally, and repealed the shotgun for electrocution.

News Items.

C. V. Mosby Company's New Catalogue.—The C. V. Mosby Company announce the publication of a new ninety-six page illustrated catalogue of medical, nursing, pharmaceutical, and dental publications.

Seven Hospital Projects Approved.—Secretary of Treasury Mellon has approved seven hospital projects recommended by the board of consultants on hospitalization, for the treatment of former soldiers. They involve an expenditure of \$3,101,000.

Fordham Medical College Closes.—Fordham University's Medical College will close its doors and go out of existence when the present senior class is graduated on Thursday, June 16th. The college has a deficit of \$342,863, averaging \$21,429 a year for the sixteen years it has been in operation. Excluding from the total deficit \$180,000, representing the cost of the medical building, maintenance charges ran behind \$162,863, or a yearly average of \$10,179. New students have not been admitted to the college for two years, when it was decided that each department of the university must be self-supporting.

Harvard Raises Tuition.—An increase in tuition fees at Harvard University has been made necessary by an advance in expenses and an estimated deficit for this year of more than \$300,000. In the Medical School an increase from \$225 to \$300 will become effective with those entering next year, but will not apply to those already enrolled.

New Officers of the American Pediatric Society.—At its thirty-third annual meeting held in Swampscott, Mass., June 2d, 3d, and 4th, the American Pediatric Society elected the following officers for the ensuing year: President, Dr. Maynard Ladd, of Boston; vice-president, Dr. Percival J. Eaton, of Pittsburgh; secretary and treasurer, Dr. Howard C. Carpenter, of Philadelphia; editor and recorder, Dr. Joseph Brennemann, of Chicago.

Prize Essay Awards.—The New York Diagnostic Society announces the following prize essay awards for the 1920 contest. The subject was Group Diagnosis. The first prize of \$300 in gold went to Dr. F. Thompson Leys, the second prize of \$150 in gold was given to Dr. Clinton Lake Potter, and the third prize of \$50 in gold was awarded to Dr. Homer E. Smith. Sixty-one essays were submitted.

Insanity Increasing.—Dr. J. M. Lee, of Rochester, N. Y., before the annual convention of the American Institute of Homeopathy, declared insanity was increasing due to the world war and its aftermath. Methods of living, eating and the general hustle and tendency to worry and brood make for throwing mental machinery out of gear. Farmers were more susceptible to insanity than any other class, because they work hard, worry much and have little recreation.

New York and New England Association of Railway Surgeons.—The thirty-first annual session of this association will be held at the Hotel McAlpin, New York, on Saturday, October 29, 1921. Dr. Charles H. Mayo, of Rochester, Minn., will deliver the oration in surgery. The program will include a symposium on surgery of the stomach and duodenum. The officers of the association are: President, Dr. J. Frank Black, of White Plains, N. Y.; corresponding secretary, Dr. George Chaffee, of Binghamton, N. Y.

New York City Hospitals Rank in Class A.—Improvement in the efficiency of the city hospitals until all have been rated in Class A by the American College of Surgeons has taken place in the last three years, according to the report of Commissioner Bird S. Coler, of the Department of Public Welfare. The higher hospital standards were brought about by uniting all hospitals of the department under the supervision of a general medical superintendent, and by a policy of monthly conferences of the attending physicians of the various hospitals.

Gives Honor to Dr. Long.—Dr. William Crawford Long was officially recognized by the University of Georgia as the discoverer of anesthesia. This action was taken despite the decision of the Hall of Fame in New York, which recently awarded the honor to Dr. William Thomas Green Morton, of Massachusetts. The university authorities asserted they had evidence that Dr. Long first used ether for a surgical operation on March 30, 1842, four years prior to any other known record.

New Officers of the American Medical Association.—At the recent meeting of the American Medical Association, held in Boston, the House of Delegates elected the following officers: President, Dr. George E. de Schweinitz, of Philadelphia, Pa.; vice-president, Dr. Frank B. Wynn, of Indianapolis, Ind.; secretary, Dr. Alexander R. Craig, of Chicago (reelected); treasurer, Dr. William Allen Pusey, of Chicago (reelected); speaker of the House of Delegates, Dr. F. C. Warnhuis, of Grand Rapids, Mich.; trustees, Dr. Frank Billings, of Chicago; Dr. Wendell C. Phillips, of New York; Dr. Thomas McDavitt, of St. Paul, Minn. The next session will be held in St. Louis.

Medical Society of the State of New York.—At the annual meeting of the Medical Society of the State of New York, held in Brooklyn, May 3rd, 4th and 5th, the following officers were elected: President, Dr. James F. Rooney, of Albany; first vice-president, Dr. W. Meddaugh Dunning, of New York; second vice-president, Dr. William H. Purdy, of Mt. Vernon; third vice-president, Dr. William D. Johnson, of Batavia; speaker, Dr. E. Eliot Harris, of New York; vice-speaker, Dr. Dwight H. Murray, of Syracuse; secretary, Dr. Edward Livingston Hunt, of New York; assistant secretary, Dr. Wilbur Ward, of New York; treasurer, Dr. Seth M. Milliken, of New York; assistant treasurer, Dr. Charles Gordon Heyd, of New York.

Personal.—Dr. William Blair Bell, gynecological surgeon to the Royal Infirmary, Liverpool, England, arrived in New York recently to give a series of lectures throughout the United States under the auspices of the American Medical Association.

Dr. William A. White, of Washington, D. C., was elected president of the American Psychopathological Association, at its recent annual meeting.

Dr. John M. Swan, of Rochester, N. Y., has been appointed chairman of the upstate committee of the American Society for the Control of Cancer.

Dr. Hideyo Noguchi, pathologist and bacteriologist, Rockefeller Institute, was awarded the degree of Doctor of Science at the recent commencement exercises at Brown University.

Dr. W. G. Rows, of England, the noted neuropsychiatrist, attended the medical conventions in Boston where he read a paper on the biological significance of mental disease before the American Medico-Psychological Association.

Rear Admiral William C. Braisted was unanimously elected president of the Philadelphia College of Pharmacy and Science, at a meeting of the members held on May 9th. Admiral Braisted served on many vessels and in many naval hospitals, and was twice instructor in surgery in the Naval Medical School. He fitted out and equipped the hospital ship *Relief*. During the Russo-Japanese war he represented the Medical Department in Japan, and was decorated by the Mikado. During the world war the surgical, medical and pharmaceutical branches of the Navy were under his charge. He recently retired as Surgeon General and Chief of the Bureau of Medicine and Surgery of the U. S. Navy, a position which he had held since 1914.

Peking Union Medical College.—Plans have been announced for the dedication of the new buildings of the Peking Union Medical College, erected by the China Medical Board of the Rockefeller Foundation. The ceremonies will fill the week from September 15th to 22nd, and will include an international medical conference, to which scientists from America and European countries as well as from the Far East, have been invited. At the time will also occur the inauguration of the director of the college, Dr. Henry S. Houghton, and regular sessions of the institution's board of trustees, which is composed of representatives of the Rockefeller Foundation and of six missionary societies which had maintained an earlier medical college in Peking. The Peking Union Medical College comprises not only the medical school but also a two hundred and fifty bed hospital with outpatient clinics, a nurse's training school, and a premedical school, an institution of junior college grade with a distinct faculty and group of laboratory and classroom buildings.

Died.

BUZZELL.—In Standish, Me., on Monday, June 6th, Dr. Leonard O. Buzzell, aged seventy-two years.

CUNNINGHAM.—In Birmingham, Ala., on Monday, June 6th, Dr. Russell McWhorter Cunningham, aged sixty-six years.

DESSAU.—In New Rochelle, N. Y., on Saturday, June 11th, Dr. S. Henry Dessau, aged seventy-three years.

DINKELSPIEL.—In New York, on Monday, May 23rd, Dr. Edgar Dinkelspiel, aged forty-four years.

EDMUNDSON.—In Bethel, Tenn., on Wednesday, May 25th, Dr. Van O. Edmundson, aged sixty-six years.

FREI.—In Brooklyn, N. Y., on Sunday, June 12th, Dr. Emil Frei, aged forty-nine years.

GREEN.—In Martinsville, Ind., on Thursday, June 9th, Dr. Elijah V. Green, aged seventy-two years.

GROFF.—In Doylestown, Pa., on Friday, June 10th, Dr. James E. Groff, aged sixty-five years.

HOWELL.—In Philadelphia, Pa., on Tuesday, June 7th, Dr. Ellen W. Howell, of Middletown, N. Y., aged fifty-three years.

JANNEY.—In Riverton, N. J., on Wednesday, June 15th, Dr. Joshua D. Janney, aged ninety years.

JOHNSON.—In Pruntytown, W. Va., on Tuesday, May 31st, Dr. Charles F. Johnson, aged seventy-six years.

KELLY.—In Kellyton, Ala., on Thursday, June 2nd, Dr. John Baker Kelly, aged sixty-two years.

KNORR.—In Berlin, Germany, on Tuesday, June 7th, Dr. Ludwig Knorr, aged sixty-two years.

LONGYEAR.—In Detroit, Mich., on Thursday, June 2nd, Dr. Howard W. Longyear, aged sixty-eight years.

MCGAURIN.—In Newburyport, Mass., on Wednesday, June 15th, Dr. George D. McGaurin, aged seventy-one years.

MCINTYRE.—In New Albany, Ky., on Monday, June 6th, Dr. Charles W. McIntyre, aged eighty-one years.

MARTIN.—In Jamestown, N. Y., on Monday, June 6th, Dr. Orello S. Martin, of Salamanca, N. Y., aged seventy-three years.

PALMER.—In Mechanicsville, N. Y., on Wednesday, June 3rd, Dr. Frank A. Palmer, aged sixty-one years.

ROBERTS.—In Holmdel, N. J., on Wednesday, June 15th, Dr. D. Edgar Roberts, aged sixty years.

SCOTT.—In Aspinwall, Pa., on Monday, June 6th, Dr. J. Lorentz Scott, aged twenty-six years.

SCRIMGEOUR.—In Bridgeport, Conn., on Wednesday, May 11th, Dr. Arthur Scrimgeour, aged thirty-eight years.

SPICER.—In New York, on Monday, June 6th, Dr. William Henry Spicer, aged fifty-six years.

STILL.—In Johnstown, N. Y., on Tuesday, May 31st, Dr. David Vedder Still, aged sixty-six years.

TUCKER.—In Nobelsville, Ind., on Monday, June 6th, Dr. Frederick A. Tucker, aged forty-nine years.

LONDON LETTER.

(From our own correspondent.)

Fellowship of Medicine—Influenza in France—The Crisis at King's College Hospital—The Dreadnought Hospital—Bad London Milk—Dr. Adami on Malaria—Need for More Houses—Professor F. G. Hopkins Made Sir William Dunn Professor of Histological Chemistry at Cambridge—Honor for an Irish Doctor—Obituary.

LONDON, May 27, 1921.

For some time efforts have been made to bring about an arrangement between a London hospital and the Fellowship of Medicine for postgraduate teaching. It is now understood that a draft memorandum has been drawn up by representatives of the Fellowship and members of the staff of the Great Northern Central Hospital. The object is to associate the hospital with the Fellowship, and so to make of it a kind of Mecca of British medicine, which may be visited by medical men from America and other countries who desire to study our methods and to improve their knowledge. If it comes to pass, it will be for the good of the hospital. On the other hand, such an arrangement will in a high degree benefit the Fellowship, as the hospital enjoys a great and well deserved reputation, and its physicians and surgeons include some of the most capable and progressive minds in modern British medicine.

Although the postgraduate scheme in connection with the Fellowship of Medicine appears to lag somewhat, there are signs now that progress is being made with this scheme initiated by that great organizer, Sir John MacAlister, secretary to the Royal Society of Medicine. Money is needed to render the postgraduate medical teaching movement in London a complete success, and if the London medical profession hope to make of London a medical centre capable of competing successfully with Berlin and Vienna, not only must funds be forthcoming with reasonable promptitude but every effort must be made to assist Sir John MacAlister in his task of organization. The coöperation of the Great Northern Central Hospital is a step in this direction.

* * *

It has been announced recently that the authorities are manifesting concern over the spread of the influenza epidemic, which is not confined to military establishments, although the death roll is heaviest among soldiers. At the Bégin Military Hospital, which serves the garrisons in the Paris district, there are said to be two hundred cases. M. Barthou, War Minister, describes the outbreak as rather violent and has taken measures to arrest its progress. More deaths have occurred among the young soldiers of the Orleans garrison, where there are one hundred and fifty influenza patients, for the most part suffering slightly. The cases in the Saint Etienne barracks number sixty and at Bourges, where there have been some fatal attacks, there are three hundred men in the military hospital. Soldiers have died in hospital at Albi, where there are cases among civilians.

Another report says that numerous French military barracks at present occupied by young recruits of the 1921 class, who by common consent show an exceptionally fine standard of physique, have been attacked by an epidemic of Spanish "flu." According

to the medical officers dealing with the outbreak, the disease has been spread mainly by bugs, which seem to have invaded the barracks in large numbers. Energetic measures are being taken to combat the epidemic, but there have been several deaths recorded at Orleans and in the military hospital of Le Puy.

* * *

The following statement has been issued by the committee of King's College Hospital, London. "In the expectation that Lord Cave's committee would make some generally acceptable proposal to relieve the financial position of the London hospitals, the committee of King's College Hospital has refrained from taking action to meet the position in which the hospital stands; but they have now been obliged, regretfully, to come to a definite decision. At the end of 1920 the debt was £80,000 (\$400,000), for which the only security was investments of the present value of about £20,000 (\$100,000). Since then it has been increasing at the rate of about £1,000 (\$5,000) a week. At present the income does not show any appreciable signs of expansion, though the committee look forward with confidence to some substantial result from the systematic support in small contributions from large sections of the community served by the hospital. The committee, although they have already a waiting list of nearly 1,000, have been impelled, in the hope of avoiding a worse disaster, to refuse for the present to take any more inpatients until the number of occupied beds is reduced to 200. As accommodation is thus released they hope to make arrangements so that the vacant beds may be used as a means of obtaining additional income by the provision of accommodation for paying patients."

The above has been quoted as a typical instance of the difficulty in which big British hospitals are at the present time and as showing that those responsible for the management thereof are coming round to the pay system or partial pay system. State control is an abomination to medical men and the majority of the laity alike, so that other means must be found to place the hospitals on a sound financial basis. Good organization is doubtless one of these means.

* * *

The Dreadnought Hospital for Seamen celebrates its centenary this year and in view of the fact and of the good work done in it it may be of interest to American readers to give a brief account of this institution.

The Seamen's Hospital Society, which is responsible for the hospital, was founded in the winter 1917-18 to provide temporary relief to the great number of distressed seamen who were at that time to be found in the streets of London. In 1821 a hospital was set up aboard the *Grampus*, a fifty-gun ship, moored off Greenwich. In 1830 the Government provided a larger ship, the *Dreadnought*, 104 guns, from which the present hospital takes its name. In 1870 the hospital moved ashore into the old Infirmary of Greenwich Hospital, where, after reconstruction on modern lines, it still carries on its benevolent work among seamen of all nations. A branch hospital in the Albert and Victoria docks now contains fifty beds and a large outpatient department.

The work of the institution is supplemented by that of two important medical schools, the London School of Tropical Medicine and the London School of Clinical Medicine. There is also a postgraduate school at Greenwich, to which a number of naval surgeons are assigned each session. In the connection it may be remarked that so far as tropical medical teaching is concerned, London is far ahead of the European medical schools. The London School of Tropical Medicine is, with the possible exception of that of Liverpool, the most complete in every respect in the world. Moreover, it has plenty of material and its staff is second to none.

* * *

A bacteriological examination of fifty samples of milk, carried out by Dr. F. H. Teale, of University College Hospital for the St. Pancras Borough Council, revealed serious contaminations in the milk ordinarily used throughout that borough. On the analyst's report the medical officer of St. Pancras stated that the eighteen samples of farmers' milk as delivered at railway stations "are almost without exception bad," as judged by a given standard and that samples taken at milk shops and on milk rounds are "definitely worse," indicating "a further stage in the ill effects of bad methods of transportation and storage, lack of cleanliness and the keeping of milk at too high a temperature." Dr. Shaddick Higgins, the medical officer, in agreeing with the analyst as to the precautions which should be taken, stated: "I have no hesitation in saying that the present system whereby the milk is passed from vessel to vessel and handled under unsuitable conditions is thoroughly bad." The St. Pancras Borough Council have already made representations to the Government that in the interests of the cleanliness and purity of the milk supply of London, the provisions of the Milk and Dairies' Act, 1915, should be brought into immediate operation. The committee declare that the result of the bacteriological examinations strengthens the case of the Council in favor of a purer milk supply being enforced.

America is a long way in advance of Great Britain as to regulations for the guarding of milk from infection and contamination. Transport of milk by railway in this country is inadequate and defective and the care of the milk after it reaches its destination by rail is by no means up to the mark. Some few years ago a series of articles were contributed to the *Lancet* dealing with the milk supply of London, but little improvement in this direction has been witnessed in London.

* * *

Dr. J. G. Adami, Vice-Chancellor of Liverpool University, delivered recently a health lecture in London, in which he drew attention to the fact that though it had been abundantly proved that malaria was due, not as was at one time supposed to miasma arising from the low lying ground, but to mosquitos, and that the progress of the malarial bacteria could be arrested by pouring oil on the stagnant waters. So difficult was it to destroy deeprooted tradition that there were still many people in Cambridgeshire who did a thriving business in supplying the country folk with their weekly bottles of laudanum as a sup-

posed safeguard against malaria. He added that General Allenby won one of the most brilliant victories of the whole war against the Turks mainly through his knowledge of the incubation period of the disease.

Warning the audience against the terrible racial effects of venereal diseases, he expressed the view that the majority of the cases of rheumatoid arthritis that occurred during the war were of venereal origin, and he strongly advocated the adoption of preventive precautions, not for the sake of impurity for the selfish indulgence of uncontrolled passions, but in the interests of posterity.

* * *

Speaking at the Housing and Town Planning dinner, Dr. Addison, late Minister of Health, said that although there had been a change of office, the Government had promised that there would be no change of policy as regarded the housing question. But he advised the public to keep the Government up to their promise. Some £14,000,000 was spent in dealing with tuberculosis, which was very largely a result of bad housing conditions.

* * *

Prof. Frederick Gowland Hopkins, professor of biochemistry at Cambridge University, has been elected Sir William Dunn Professor of Chemistry in Cambridge University. Professor Hopkins is well known for his investigations into and discoveries with regard to the vitamins.

* * *

King George has been pleased to approve that the honor of knighthood be conferred upon James Craig, Esq., M. D., F. R. C. P. I. Sir James Craig is one of the best known medical men in Ireland, where he holds many public appointments. He is king's professor, professor of medicine at Trinity College, Dublin, president of the Royal College of Physicians of Ireland, physician in ordinary to the Lord Lieutenant, physician to Sir Patrick Dun's Hospital, Dublin, and consulting physician to various institutions. He received his medical education at Trinity College, Dublin, and took his degree in 1885. Since that date there are few of the more important posts of the profession in Ireland which he has not filled. He was general secretary and editor of transactions of the Royal Academy of Medicine in Ireland from 1904 to 1910. Sir James Craig is also an extensive contributor to the literature of the profession.

* * *

The death is announced of Mr. Henry Juler, F. R. C. S., the well known ophthalmic surgeon. Mr. Juler was the son of a medical man, Dr. H. C. Juler. He was educated in London, Paris and Berlin, and was a student at St. Mary's Hospital, London, as well as at various Continental schools. He became medical superintendent of St. Mary's and pathologist to the Royal Westminster Ophthalmic Hospital and consulting ophthalmic surgeon to St. Mary's. He wrote several works on the eye, including *A Handbook of Ophthalmic Science and Practice*. He was widely known and highly esteemed, both as a surgeon and as a man.

Book Reviews

KEEN'S SURGERY.

Surgery, Its Principles and Practice. By Various Authors. Edited by WILLIAM WILLIAMS KEEN, M.D., LL.D., Emeritus Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia. Volume VII, with Three Hundred and Fifty-nine Illustrations, Seventeen of Them in Colors. Volume VIII, with Six Hundred and Fifty-seven Illustrations, Twelve of Them in Colors. Complete *Index to Keen's Surgery*, Volumes I to VIII. Philadelphia and London: W. B. Saunders Company, 1921. Vol. vii, 855; vol. viii, 960; Index, 182.

These volumes complete Keen's great surgical masterpiece. The six preceding volumes, reviewed in this journal at the time of their publication, recorded the progress of surgery up to 1913. Then with the onset of the great war came its surgical problems and their solution—all of which constitute in themselves a most remarkable contribution to the art and science of modern surgery. The advances in surgery, which resulted in consequence of the vast human slaughter in the great conflict, are embodied in the two volumes under consideration.

Volumes VII and VIII are distinctly products of the war—not war babies, but war giants—which have made available for the surgery of peace what has been learned in the crucible of war. The outstanding lesson we have been taught is that modern surgical principles have been tried and not found wanting. The great principle enunciated by Pasteur and Lister, that infection is caused by bacteria and can be overcome only by removing or destroying them, was established for all time, more firmly than ever, with the complete vindication of Pasteur and Lister.

This is made strikingly evident by the fact that Keen found difficulty in obtaining an author to write the chapter on tetanus. Most of the surgeons who had served in the war had seen not more than one or two cases, and many had not observed a single case. Typhoid, like tetanus, the scourge of past military conflicts, was practically unknown, except for the first few months of the war.

Professor Keen comments with evident bitter memory on the German violations of the rules of mercy and humanity in warfare, and replaces the ancient classic *Fides Punica* with *Fides Germanica*—a title richly deserved.

In a work of such stupendous proportions and general excellence, it is difficult to select for comment or praise any particular author or his contribution. Most of the subjects have been treated by surgeons of international repute, whose names

are at once a guarantee of high scientific learning and practical experience.

A few of the outstanding chapters might be mentioned: Volume VII contains an unusually fine chapter on inflammation, by Adami; syphilis and surgery of the skin, by Schamberg; traumatic shock, by Cannon; fractures, by Eisendrath and Straus; gunshot fractures, by Blake; orthopedic surgery in civil life, by Lovett. The articles on military surgery in its various phases are exceedingly well written and constitute a distinct addition to our knowledge of the horrors of warfare and the surgical means of mitigating them. The illustrations are most illuminating, and many of them bear official governmental sanction, having been loaned for the purposes of this work by the British Admiralty.

Volume VIII contains forty chapters, each covering a particular topic by its own author. Endocrine surgery covers six chapters, well written by such well known surgeons as C. H. Mayo, L. B. Wilson, Kendall, Mann, Adson and Vinson. Neuhof contributes an excellent chapter on the surgery of the head; the abdomen and pelvis are considered by Crile; Deaver and Pfeiffer present the subject of appendicitis; Bransford Lewis has written interestingly on the bladder and the ureters, and E. L. Keyes, Jr., on the external male genitals, including a rather inadequate consideration of gonorrhoea; radium in cancer and other diseases is discussed rather fully by Duane and Greenough, and the x ray by Cole and Steiner. Anesthesia in its various aspects is fully treated. In addition there are interesting chapters on the legal relations of the surgeon, and the American Red Cross in war and peace.

A desk index, in a bound volume of 182 pages, completes this most excellent work. Even a cursory reading of these volumes must give the student or practitioner the sensation of having touched the heights of our surgical knowledge of the present day. American surgery can boast of nothing finer or more worthy of a permanent place in surgical literature than this monumental work of Professor Keen. The timeliness of adding these two volumes at the present moment is important. The surgical procedures developed during the war have been studied and presented after mature deliberations.

This distinguished master, his coworkers, his publishers, and the American medical profession generally and severally, deserve to be complimented on the successful termination of their combined efforts.



WILLIAM WILLIAMS KEEN,
Editor of *Surgery, Its Principles and Practice.*

STEKEL.

Die Geschlechtskälte der Frau. Eine Psychopathologie des Weiblichen Liebenslebens. Von Dr. WILHELM STEKEL, Nervenarzt in Wien. Wien: Urban & Schwarzenberg, 1920. Pp. viii-402.

Die Impotenz des Mannes. Von Dr. WILHELM STEKEL. Berlin-Wien: Urban & Schwarzenberg, 1920.

It does not matter from what angle these two books of Stekel are approached. Any consideration of them reveals rich material. Stekel is a writer who handles his subjects in a lavish manner; lavish, but with that restraint which bends all to the urgency of his themes. He evidently approaches his clinical work with the same exuberant interest. There he reaps through psychoanalysis a rich harvest of results. He has collected these results and presented them for the dissemination of such knowledge of the sexual disturbances as he has thus obtained. Stekel evidently has approached literature and other cultural fields of interest in the same way. His acquaintance with these fields both broadens and strengthens his conception of the more technical human problems that form the subjects of his writings here. It gives his work that literary character which always belongs to his most professional treatises. There is also a high moral tone to his work, and through it a sort of determined optimism that the race must and shall better its suffering condition through greater knowledge of the underlying factors of the suffering. The evidence of forceful adherence to such determination in these reports of his work reveals the spirit in which he approaches that work through patient as well as through reader.

It is important in approaching his writings that special emphasis is laid upon them from the professional point of view. For it is not first for their literary character nor their mere force of presentation that they are valuable. At the same time, one will not find any such limitation as the titles of these two volumes of his series might suggest to the less thoughtful reader. They are no mere formal collection of statistics compiled from a routine review of case histories. Nor, on the other hand, will they afford a mere opportunity for an inquisitive revel in sexual details. Sexual details there are in abundance, but any superficial interest would be soon transformed into a conscience stirring realization of the terrific importance of the factors that are playing havoc in the domestic and social adjustments of men and women and the necessity of taking them frankly into account. Stekel has unearthed many facts, he has disentangled many snarls which are all too common, not in a few men and women in a far away city, but in all the lives of the members of civilizations.

There are faults in these books which might be attacked from various angles. Some lie in that very exuberance of personality and its expression which one finds otherwise commendable. At times the matter in hand might gain in force were the writer himself a little more effaced. Yet because this is so largely a fault of his dynamism one cannot seriously quarrel with it. Occasionally there may be detected some personal weakness of criticism of fellow workers in which the author does not invariably add to the weight of his own position. It is not always so, but a somewhat purile note of com-

plaint creeps in in which the writer's own position is not each time well established. There is some unnecessary and rather mistaken effort to claim first discovery in one or two instances, or complaint that such has been plagiarized by some one else. Again, as in the chapter on *ejaculatio præcox* in the second book, Stekel has not proved his position as of any advantage over that of Abraham, which he condemns, or any better established. It is the same in his disagreement with Freud over the interpretation of fundamental causes to be found in infantile factors and other such technical points. Of course, to enter carefully into these criticisms would bring up the whole controversy which has waged in the psychoanalytical circles of Vienna. Such need not press itself specially upon our attention, nor could one here be in the position to pass complete judgment even in strictly technical points.

Surely it is not necessary in the face of these valuable contributions to the literature of psychoanalysis. In spite of the slight suggestion at times of a personal animosity in comparison in spite of a somewhat dogmatic method of stating Stekel's own conclusions, one is carried on by the far more important positive values of the books. One can also recognize with satisfaction for the genuine interests of psychoanalysis the grateful deference with which Stekel takes pains to acknowledge all his debts to the originator of the psychoanalytical method. This is true even though one must sometimes smile at the overcompensatory character of this deference when it follows upon a derogatory comparison of method and result. In fairness to psychoanalysis one must ask also whether some of Stekel's work is not the result of his forceful personality, and is therefore not always completely psychoanalysis. This can be said without denying that he understands psychoanalysis as a method really of analyzing and so employs it. He has given rich proof of this in his published cases. Yet there is often also, or in place of this, a strong note of authoritative advice and direction. To be sure, he admits that at times he chooses such means, and he has discussed freely the use of distinctly other therapy than psychoanalysis. At times, however, he seems not to have kept sufficiently clear the distinction of psychoanalysis as such.

The book that roused no criticism would be of little worth. If, therefore, it has been sufficient to set the reader to weighing for himself the writer's rapidly flung statements in which he propounds his own opinions of method and his own conclusions, the task may be resumed of commenting upon the most valuable material gathered in these thick volumes. Facts are there in great number. They cannot be gainsaid. Stekel's own evaluation of such facts and his earnest plea for their consideration, both by the medical profession and by the society of men and women where these facts exist, can speak only for themselves to the truly conscientious reader.

There is not much in these books that the psychotherapist can afford to pass over. Voluminous as they are, their material needs detailed attention, both from one practically engaged in the work in which Stekel takes so prominent a part and from

any one genuinely interested in the restoration of the lives of men and women to healthful social functioning. Stekel makes some announcements which may be startling at first sight, but when they have been pounded home through page after page of illustration, the reader is left convicted of a responsibility for himself and for society. He must deplore that they have been too long passed over in ignorance and that still they meet with so much timid opposition.

Stekel has made his fundamental statement in the opening of the former of these two volumes. This he reiterates again and again, chiefly as he forces upon us one case after another in which his statement has shown itself disastrously true. Then he pleads that help shall come for this prevailing disastrous condition through an adjustment of civilization to the needs of the individual in the light of this fundamental fact. His statement reads: "We assert firmly the distressing truth: The majority of men standing at the higher cultural level are relatively impotent; the majority of women from the same social level are sexually frigid!" He asserts again and again that this sexual impotence—we may apply the term to the female frigidity as well—is a psychically determined condition. There is particular need of such frequent assertion, especially in regard to male impotence, because there has been so much effort to find any one of a variety of causes for the phenomenon. The patient has done it on grounds which he has rationalized out of his conflicts; medicine has devised explanations and treatment out of a disregard of the vast play of psychic forces, largely unconscious, which have manifested themselves for one hidden reason or other in the patient's life.

This fundamental statement is, after all, only one of a number of truths which punctuate the writing of the books. They are almost aphorisms in form, but are saved from a too abstract terseness by the fact that they are pregnant facts wrested out of repeatedly related experiences, human, personal, intense. They drive home the inescapableness of the problems; they present vividly the various points at which the problems manifest themselves; they stress the importance of sex efficiency in determining health in the lives of men and women. Stekel takes the trouble, first of all, to define what love is to the individual in its various manifestations and what it should be if these were better understood. For then these partial manifestations, which deceive the individual, would be seen in their full meaning as related to the inner life and to external things in the individual experience and as only factors of complete love and distortions of the love instinct. The whole would be found to be something more than these. It would be found that this whole was grounded and centered in sex expression.

Somewhere in the latter of the two books Stekel speaks of an antisexual instinct at war with the sex instinct. By this he means that will to power which he describes in the earlier book, and continually refers to throughout all his reports. This interferes with the complete surrender to sex enjoyment. It results in an instinctive strife which exists between man and woman. Is not this the particular manifes-

tation in the sex relationship of the distinction to which Freud calls attention when he reminds us of the strife between the ego instinct and the creative libido, "ego-libido and object-libido," as he calls it? Stekel finds it a most important principle to be borne in mind when searching for the factors underlying impotence and frigidity; in fact, in following out the whole conflict by which man and woman through life have built up a resistance to the free yielding and therefore the free expression of self. It is found operative in earlier relationships of life and then in the sex relation. Stekel says: "Two bipolar forces strive for mastery in the human psyche, the will to power and the will to subjection. This bipolarity of feeling forms the basis of the perfect relation of man and woman, but there may be unconscious conflict in the nature of either or both against accepting the role of either feeling." In the woman, then, "the desire for mastery can be more important to her than the pleasure of being satisfied; the feeling of personality of greater significance than the strength of sexual sensation." The woman cannot give herself to her sexuality because deeply hidden in her unconscious she will not. The man, too, may be hindered by this deeper will of which he does not know from carrying out his apparent sex need. In both man and woman love has been replaced by unconscious hate. Many times analysis shows how his "will not" is further entangled with defensive wishes against the force of some of the components of his sex wishes, chiefly the sadistic components, sometimes in its most extreme forms. Both men and women are afraid to give way to the strength of the desire, the passion they feel within themselves. Of course, this is largely due to the fact that they do not understand the component erotic forces of which the passion is composed. This often means that such separate components are strengthened in early life. Infantile wishes, retained in infantile fixations, homosexual reversal of the roles, all the factors known from psychoanalysis are found to be operative in withholding the libido from the complete performance or acceptance of the sex act.

Stekel asserts that he does not lay such exclusive emphasis upon the infantile factors as Freud does, nor does he believe it necessary, in many cases, to proceed so far back in a life to correct these sex difficulties. He makes this point particularly in reference to the treatment of impotence in the male, where often some comparatively recent inhibition acts as a moral guardian through prevention of a forbidden sex act. Sometimes, again, it negatively serves the forbidden wish by inhibiting function in both permitted and unpermitted situations. These instances serve as illustrations of the exceedingly numerous and varied complications which result when the personality is torn by conflicting wishes. The bringing of these into consciousness by psychoanalysis brings the personality back to a unity of action. Potency returns with a readiness which disproves the validity of the organic or otherwise rationalized causes attributed by the patient or physician to the previous condition. Of course, there are cases greatly complicated by stubborn factors of resistance built for a long time into the

patient's psychic life where the will to an adjustment is not present, where the patient does not want to give up the sources of his conflict, just as in all psychoanalytical or other medical experience. In spite of this Stekel is able to report a striking array of cases of often sudden and complete return of male potency and readjustment by the woman with understanding and acceptance of her sex life.

One is impressed with the pervasion of these conflicts by infantile factors and experiences of early life, even though Stekel avoids laying what he considers too exclusive emphasis upon them. His discussion of the infantile or regressive type of reaction to life, as over against the thoroughly adult type of adjustment, is clearly stated in more than one place and in that peculiarly picturesque manner whereby he makes his statements crisp and vitally telling. He devotes special attention also to the traumas of adulthood, showing that these play an important part in the sexual inhibitions which result in impotence and frigidity. He speaks of these in a separate chapter in the book devoted to the woman's difficulties, and lays special emphasis upon the reaction to the first sexual experience as determining largely the later reaction. He himself says that this pertains to men as well as to women. Anxiety concerning the first coitus and further fear of the bondage of the marriage relationship are often unconscious determining factors of impotence. Stekel warns particularly against neglect of the unconscious religious factor in the lives of patients.

Such are some of the many complicated facts revealed at work hindering the fundamental functioning of lives. Long analyses are given, sometimes long selfconfessions in the form of written histories by certain patients themselves. Here is the feminine counterpart of Don Juan, again the female homosexual. There are corresponding illustrations of these and other types of diversion of the sex life in the male. In all the background is relatively the same. There are the conflicts set in the early family life, the contradiction of conflicting impulses, the neurotic reactions. All are manifestations of the struggle of the sex impulse against conditions of cultural life. For this has failed to allow for the strength of the sex life with its need for complete realization in an expression which can absorb the whole personality. Stekel summarizes the conflict now and again in one of his pregnant sentences. It is the struggle between the psychic and the physical love, a conflict which can be solved, he continually urges, only by a complete union of the two. To this end he works in his individual analyses, to this end he urges society to make less exacting conditions for the complete relation of man and woman. Again, he states it as the conflict between the brain and the spinal cord. In the interests of culture the brain has forgotten the needs represented by the spinal cord and has imposed conditions impossible of fulfillment. Stekel does not plead for license, but for a freedom for love to find and retain its own. He does not believe that true love can have more than one object at a time. He does allow for the transfer of love in the changes that life inevitably brings. Here he believes that social sentiment should enlarge itself to recognize the underlying need

and the facts that do exist in this deepest relation of man and woman. The rigid social bondage, where love has ceased to exist, he believes to be an immoral relationship, which could be exchanged for the true love which both the man and the woman need. Yet behind these statements of this principle lies something which can reassure society against fear of domestic collapse. Stekel's own healthy comprehension of true love and his experience of the readjustments made by his patients, when their difficulties and their possibilities for true love came to be understood, show that true love can be established and maintained. Once the inhibitions are removed, their sources in conflicting impulses brought to light, love has something far more than the initial passion and the mere physical need, strong and broad as that may be, for its constantly varying adjustments and its maintenance upon them. If society would lift its pressure of timid selfdefense, elasticity of health for the family, society and the individual would result.

The problem is not presented, however, in such mere Utopian simplicity. There are chapters demanding searching thought in which the author discusses the question of woman's needs, her striving through the many avenues of today for something more than a mere physical bondage to sex. She demands the complete union of physical and psychic love. The problem of childbearing in its relation to her love life, as well as to that of the man, and also its economic aspect, is taken into account. Stress is laid upon the great danger to society as well as to the individual in the single child marriages, or those with perhaps two children. They are productive of neuroses in the younger generation, and this matter forms a serious phase of the actual sexual question, whether considered individually or in relation to the results to society. The consideration of the devastation wrought by the war in further straining the relations between men and women and strengthening of the homosexual bond also bears special reading.

These social presentations of Stekel's subject are so pressing and offered with so much stimulus to serious thought that there is danger in review of passing over the more strictly medical value of the book. The discussion of these sexual problems has been approached from several points of view in which the physiology of the disturbances has been most simply but clearly discussed and always with its relation to the psychic factors inextricably bound with the physiological manifestation. This is true chiefly in the book on male disturbances, since in these the physiological effect is conspicuously in evidence. A special chapter on physiology treats of these physiological phenomena of sex disturbance, while a chapter on pollution has been contributed by Dr. Tannenbaum of New York. The relation, or, rather, the supposed relation, of masturbation to impotence receives especial treatment, since this has occupied so large a place in medical thought of the past and still more with the laity themselves. Ejaculatio praecox and impotentia paralytica are given separate chapters, and are followed by a still further discussion of the disturbances of the organism in its different forms and degrees.

Practical Therapeutics

ENDOCRINOTHERAPY IN SKIN DISEASES.

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The subject of endocrinology grows from day to day in importance and interest to the clinician and to the research worker. A voluminous literature has grown up on every phase of the subject in its clinical and experimental aspects, yet one is struck by a surprisingly scant reference on the clinical application of endocrinology to dermatology. Among very few data found in the literature, I wish to acknowledge most excellent contributions by the American writers, Foerster (1), McEwing (2), and Montgomery (3). This paucity of dermatological data is particularly strange, since the dermatological syndrome, myxedema, was one of the first clinical phenomena that attracted the attention of clinicians to the endocrinous system.

TROPHONEUROTIC INFLUENCE OF ENDOCRINOUS GLANDS ON THE SKIN.

The problem of outlining the possibilities of endocrinotherapy in skin diseases can best be approached through considering the interrelationship between endocrinous glands and the skin. This relationship in its turn can best be seen through a study of the enormous clinical field limited by dermatological syndromes, myxedema at the one end and hyperthyroidism at the other.

HYPOTHYROID SKIN.

In myxedema, the extreme type of hypothyroidism, the skin is pale, thick, pasty, cold, dry and harsh, does not pit on pressure, and presents a dead, muddy, yellowish and waxy appearance. In mild chronic cases of hypothyroidism, which can be considered as abortive cases of myxedema, one sees dry, harsh skin with a tendency to scurfiness, a branlike exfoliation, a tendency to chap, eczematization, malar flush, cutaneous chilliness, nail dystrophies, dry, lustreless hair and alopecias, particularly of the outer third of the eyebrows.

HYPERTHYROID SKIN.

On the other hand, in hyperthyroidism one sees thin, perspiring, easily flushed skin, urticarial attacks, erythemas, pigmentations, dystrophies of the nails, alopecias and eczemas; the hair is thin and glossy, the complexion is clear. What a striking illustration this presents of the powerful and all pervading influence of the thyroid on the nutrition and function of the skin. A physiological exuberance, glandular hyperactivity, and maximum of functional and nutritional activity on the one hand—hyperthyroidism; and, on the other, a slowing down of all functional activity, gradually increasing tissue degeneration culminating almost in a total cessation of the cellular activity and normal function of the skin—myxedema.

Between these two polarities a countless number of transitional clinical forms are to be found. These cases, presenting one, two, or many of the hypothyroid skin features in various combinations and varying infinitely in the degree of intensity, form numerically a large group of dermatoses with clinically variable pictures. The clinical importance of these transitional forms collectively easily overshadows that of well developed cases of myxedema, because clear cut cases of myxedema are so rare and so characteristic as not to escape recognition. On the other hand, mild hypothyroid dermatoses and abortive myxedematous cases are common, and easily escape recognition unless the clinician is aware of their existence and is constantly watching for them.

It is of great interest to note that some of the dermatological symptoms, such as pigmentations, alopecias and eczemas, may occur both in hyperthyroid and hypothyroid syndromes. These apparently selfcontradictory findings are to be accounted for by a clinical phenomenon on which all endocrinologists agree; that the hyperactivity of the thyroid may go on at certain times simultaneously with a hypoactivity. As has been pointed out so well by Rogers (4), most of the hyperthyroid cases begin as hypothyroid, where the enlargement and hyperactivity of the gland develops as a compensatory but imbalanced effort. Thus an intermediate stage develops, which shows a coexistence and mixture of both hyperthyroid and hypothyroid skin symptoms.

OVARIAN AND GONADAL INFLUENCE.

While the trophoneurotic influence of the thyroid system is the most striking among endocrinous glands and can be presented in a concrete and tangible manner, other members of the endocrinous system exert also a powerful influence on the function and nutrition of the skin. Gonadal and ovarian hormones come next after the thyroid. Their influence on the function and nutrition of the skin is best manifested at the two physiological transitional epochs of an individual, the awakening of the puberty and the climacterium, both in the male and in the female.

The first period of physiological awakening is associated with a heightened secretory activity of the sebaceous glands, clinically manifested by seborrhea and acne vulgaris of adolescents. At this time the skin is at its highest physiological level of nutrition, shown by the exuberant increase of the vitality, gloss, tone, elasticity and flexibility, and the growth of the hair. On the other hand, climacterium in both sexes induces a progressive decline of all physiological qualities of the skin—elasticity, gloss, oily and velvety feel, with a gradual development of pigmentation, keratoses, and other features of senile atrophic degeneration. In the female these atrophic skin changes are commonly preceded by variously manifested clinical disturbances of the vasomotor apparatus of the skin, in the form of

generalized flashes, erythemata and urticarial efflorescences.

ADRENOTROPISM.

An extremely important trophic centre controlling the skin pigmentation, both in its physiological and pathological manifestations, is being more and more relegated to the so-called chromaffin system of the suprarenal gland. The basic clinical syndrome of bronzelike discoloration, established by Addison, has been extended and broadened by the latest research. Abel (5) has demonstrated in the pigment deposits of the skin a blood pressure raising substance analogous to adrenalin.

Kaplan (6) establishes a doctrine of endocrinotropism, believing that pigment deposits in the skin are made up of melanoblastic cells of the chromaffin tissue and connects them embryologically with the sympathetic nervous system. These chromaffin cells are found in the adrenal medulla and yield epinephrine. Kaplan believes that the appearance of blackish or brownish spots does not necessarily suggest grave pathological changes in the suprarenal glands, but it does point to an increased activity of the adrenal system, most likely of a compensatory character. Casual reports of vitiligo patches by suprarenal glands are also suggestive of the trophic control of the adrenal system of the pigmentation of the skin.

INDIRECT RELATIONSHIP OF ENDOCRINES TO DERMATOSES.

Beside a direct trophic relationship between the endocrine glands and various dermatoses, an indirect relationship of the same nature can be observed and established in a great variety of clinical forms. Thus, disturbances of the pancreas may lead to diabetes with its train of glycosuric dermatoses—furunculosis, eczema of the genitals, xanthoma, pruritus, and gangrene. The dysfunction of the pancreas, or any other digestive endocrine, may lead to various dyspeptic disorders with subsequent gastric or intestinal retention, fermentation, and intoxication leading to toxic erythemata, urticarias, eczematata or acne rosacea. In a similar way diseases of the hemopoietic endocrine system—the lymphatic glands, the spleen and the bone marrow, may lead to various dermatoses of a leucemic type. Beside the true lymphogranulomatous tumors of the skin, the various nonspecific dermatoses, such as eczemas, pigmentations, prurigos, exfoliating dermatitides, and purpuric lesions, belong here.

VASOMOTOR ENDOCRINE DERMATOSES.

The enormous domain of vasomotor dermatoses comprising various symptomatic or idiopathic toxic erythemata, dermatographism, local angioneurotic edemata, urticarias, erythromelalgias, acrocyanotic conditions, Raynaud's syndrome, so-called idiopathic skin gangrene, and hyperhidrosis, presents a striking illustration of indirect activity and participation of endocrinous glands and sympathetic nervous apparatus. The participation of the endocrinous system in these cases may be wholly incidental and be merely one of the many symptoms of underlying toxemia, infection or emotional play. One of the most striking and illustrative cases of this character I have seen occurred in a tuberculous patient, in an advanced stage of the disease, who had recurrent arterial erythemata, lasting for several days, of the

right half of the head, neck and right arm, corresponding strictly to the anatomical distribution of the right branches of the vagus. In cases of this type endocrine dermatoses may be an early or the only symptom of the latent infection or toxemia, and their proper interpretation may be of great diagnostic value.

HYPOTHYROID SKIN.

In considering the possibilities of the clinical utilization of endocrinous principles in dermatology, one is easily brought to the belief that the thyroid system offers the most tangible and definite clinical facts for the purpose. The profound skin changes induced by hypothyroidism, as they unfold themselves to the clinical observer in a gradual scale from its extreme expression, myxedema, to its clinical antipode, hyperthyroidism, can be conveniently classified in three groups: 1, effects on the secretory activity of the sebaceous glands; 2, effects on the processes of keratinization; 3, effects on the nutrition and growth of the hair.

The diminution and slowing down of the secretory function of the sebaceous and sweat glands is the most characteristic and constant feature of the hypothyroid skin. The resulting dryness of the skin entails a secondary development of a characteristic syndrome of scurfiness, tendency to follicular keratotic plugs, chapping, itching, eczematization, cracks and fissures, and chilliness. This syndrome is of the greatest diagnostic value, as an early sign of a mild hypothyroidism, and should be more appreciated by the general profession.

Another constant feature of a hypothyroid skin is a slight thickening and desquamation of dry epidermic scales, pointing to the interference with the processes of normal keratinization. This phenomenon of dyskeratosis is particularly apparent at the follicular orifices which are commonly filled up with keratotic plugs of proliferating epithelial cells.

The third commonly associated feature of a hypothyroid skin is dry, lustreless hair and a tendency to alopecia, diffuse in type or local; particularly characteristic is sparseness of the outer third of the eyebrows—*signe de sourcille* of the French. The dermatological syndrome of hypothyroidism is well expressed by this clinical trinity, dryness and harshness of the skin, slight exfoliation and a tendency to alopecia.

HYPOTHYROID DERMATOSES.

Various dermatoses have been tentatively associated with hypothyroidism. Thus, seborrhea is assumed by D. W. Montgomery (4) to have had a hypothyroid basis. I can accept this assumption only half way; only so-called dry seborrhea fits well into a hypothyroid syndrome. The oily seborrhea, clinically and physiologically, is the exact opposite of hypothyroidism. The hyperactivity of sebaceous and sweat glands in oily seborrhea negatives decidedly any possible relationship between it and hypothyroidism, the basic effect of which is the diminution and checking of glandular activity.

On the other hand, dry seborrhea comes clinically close to the hypothyroid skin. In dry seborrhea, normal fatty degeneration of the glandular epithelium and its transformation into oily secretion are interfered with, and proliferation and accumulation

of the epithelial cells, as dry follicular plugs, are observed. From this point of view dry seborrhea should be dissociated from oily seborrhea, as it presents a rather abortive type of it, and would seem to be more properly placed among follicular dyskeratoses.

The clinical conception of kerosis, introduced by Darier (7), seems to be a name well suited to dry seborrhea. Darier's description of it as a syndrome consisting of dirty yellowish and grayish color, the accentuation of pilosebaceous pores and slight thickening of the integument, seems to be also a good description of a hypothyroid skin, even if Darier himself at the time did not interpret it as such.

Ichthyosis has been advanced as a hypothyroid condition, both because in a few cases it has been found as a disease or atrophic condition of the thyroid, and also because of the many favorable reports in ichthyosis from the administration of thyroid.

Scleroderma has been persistently associated with hypothyroidism by many observers. A certain clinical resemblance between the edematous stage of scleroderma and myxedema cannot be denied. In spite of the fact that pathological findings of the changes in the thyroid in scleroderma are rather conflicting and in spite of the fact that therapeutic results of thyroid administration are far from being uniform, the thyroid treatment in scleroderma seems to be strongly indicated, as we have nothing better or more promising, neither in the way of therapeutics nor in the way of a theoretical explanation of the condition.

CLINICAL INDICATIONS OF THE THYROID THERAPY.

On the strength of the skin changes observed in hypothyroid cases, the clinical indications of thyroid therapy in skin diseases can be drawn fairly definitely. As a general indication, dry, harsh, slightly thickened and scaly skin, with itching or without, unless explained on some other specific grounds, calls for thyroid treatment. Various clinical forms of hyperkeratosis and dyskeratosis justify a tentative thyroid medication. Here belong ichthyosis, hereditary plantar and palmar keratosis, lichen pilaris and Darier's follicular dyskeratosis. It is a clinically established and generally accepted fact that many cases of dry chronic papulosquamous eczema benefit by the administration of thyroid. It is immaterial whether we assume that these types of eczema are etiologically related to hypothyroidism, or, having a different etiology, simply happen to be in a hypothyroid individual, and therefore benefit from the thyroid indirectly. The fact remains that a large number of these cases clear up under thyroid therapy where nothing else helps. In my opinion these cases are not uncommon, and their number will greatly increase as the clinicians become better acquainted with the fact of their existence.

It has been also reported by a number of clinicians that certain cases of psoriasis improve under thyroid administration. In my opinion such cases are by far not as common as hypothyroid eczema. Great caution should be used in selecting cases of psoriasis for thyroid therapy; only sluggish, dry, and chronic cases should be taken. Cases that show a tendency toward an acute inflammatory course and profuse desquamation are not suitable.

There is one class of cases eminently suited for thyroid medication, that is prurigo of Hebra's type and its abortive or incomplete forms occurring ordinarily as chronic urticarias in children—so-called strophulus. I believe that prurigo, as described by Hebra, is nothing but a dermatological syndrome of a severe degree of hypothyroidism. Its clinical picture comprises every feature of hypothyroid skin, barring its extreme manifestation—myxedematous degeneration. The skin in prurigo is dry, harsh, thickened and rough, particularly on the external surfaces, with a faint branny exfoliation and the sweat glandular function checked or suspended. Seasonal aggravation in winter and a tendency toward dry papular eczematization are also suggestive. The real type of Hebra's prurigo ferox is extremely rare in this country, but its mild and abortive types, chronic papular urticarias of children, are rather common and present a legitimate field for thyroid medication.

I consider senile pruritus as one of the most interesting and promising clinical indications for thyroid medication. It is an empirical axiom that merely oiling senile skin brings relief in senile pruritus, thus indicating that a paramount, if not exclusive, factor of senile pruritus is the lack of natural secretion. Whether the thyroid atrophy in senile pruritus is more marked than that of other endocrine glands, or whether thyroid hypofunction develops as the incidental feature of general physiological decline, is of secondary importance. The fact of clinical interest is that thyroid in small doses acts favorably in senile pruritus. Apparently, different textural elements of the senile skin do not atrophy in all cases at the same rate of speed, as we often see a marked senile atrophy of the skin manifested, thinning, pigmentation, keratoses, secondary venous telangiectases, without itching. In these cases the glandular activity is retained and the skin is not dry, itching is not observed, and thyroid therapy is, obviously, not indicated. Following the same line of reasoning a generalized pruritus associated with a dry, harsh, scurfy skin, which cannot be explained by any specific dyscrasia, such as diabetes or leucemia, should be regarded as potentially hypothyroid and given thyroid medication.

OTHER ENDOCRINES AS THERAPEUTIC AGENTS.

As mentioned above, the hypothyroid dermatoses present the most tangible and specific relationship and for this reason offer the most definite therapeutic results. The clinical utilization of other endocrines is resting as yet on speculative and conjectural bases. Yet, with the extension of research in this new field, the clinical and experimental facts underlying these therapeutic attempts are getting more numerous and steadily gaining in significance. Thus on the strength of the well established clinical observation that ovarian dysfunction aggravates, if not produces, acne vulgaris, rosacea, urticarias and various vasomotor skin symptoms and paresthesias, ovarian therapy is perfectly justifiable and indicated in these conditions. Symptomatic relief of urticaria and angioneurotic edema by adrenalin is well known. Favorable hemostatic action of pituitary posterior lobe on purpuric conditions is also clinically demonstrable.

The use of the digestive hormones in various dermatoses, due to the wrong assimilation and to intestinal toxemia, seems plausible and well indicated. The adrenal glands are reported occasionally beneficial in vitiligo and are worth trying, since there is no more rational or more promising therapy of the condition available.

RELATIONSHIP OF THE ENDOCRINOTHERAPY TO THE LOCAL DERMATOLOGICAL TREATMENT.

It is of the greatest clinical importance to have a clear conception of what can be expected from endocrinotherapy in skin diseases. Endocrinotherapy is a constitutional treatment affecting skin lesions through the direct or indirect influence of the trophic nerves and through a stimulation or depression of various structural elements of the skin. Its possibilities and limitations are determined by peculiarities and distinctive features of the cutaneous pathology. These peculiarities constitute a keynote to the problem of the therapeutic control of skin diseases.

PECULIARITIES OF THE CUTANEOUS PATHOLOGY.

All that any constitutional method of treatment, including endocrinology, can do and should be expected to do, is to prevent a recurrence of new skin lesions by eliminating, correcting or neutralizing the systemic pathogenic agent. It may and often does facilitate the clearing up of the present skin lesions by removing the source of cutaneous toxins and irritants. But it should be made definitely clear that systemic treatment is not sufficient to clear up local skin lesions without local treatment. The reason for this is that of all the organs of the body the skin is the only one which has a peculiar topographical location on the surface, rendering it subject to a constant irritation from all kinds of irritants—biological, mechanical, physical or chemical, endogenous or exogenous, and last but not the least, that specific dermatological insult, scratching, due to intolerable itching. Because of this, skin lesions, even if originally caused solely by a systemic irritant, develop a chain of secondary pathological changes, such as eczematization, lichenification, staphylococcus and streptococcus infection. These secondary local changes develop and perpetuate the inflammatory process independently of the systemic etiology, and cannot be controlled by the systemic etiological treatment of the primary cause, because their development has been determined by the local etiological factors. Only appropriate local treatment, applied simultaneously with the systemic, can break the vicious circle of pathogenic factors, systemic and local, intertwined and mutually retroactive in these conditions. This is why local treatment is indispensable in all types of dermatoses, both systemic and local, and why the best results in systemic dermatoses are obtained by the combined treatment, systemic and local.

On the strength of this clinical observation, in all cases I have combined endocrinotherapy with the appropriate local treatment. The assumption that the local treatment detracts from the validity of the claims of endocrinotherapy is easily refuted, not only by the fact that the administration of endocrines prevents the recurrence of skin lesions, but also by the fact that the addition of endocrines to

local treatment clears the lesions where local treatment alone was ineffective.

CASE REPORTS.

The following cases have been selected from a large number, and are cited merely to illustrate the clinical type where favorable results from endocrinotherapy, preeminently the thyroid, can be expected:

CASE I.—Mrs. A. L., aged twenty-seven, married; a frail, highly neurotic woman who had suffered from a distressingly itchy, dry, papular, recurrent eczema of the chest, back and upper limbs for eight years. Local treatment, including x ray, had given only a short relief. Food proteid tests for beef, pork, eggs, etc., were negative. Various restricted diets were ineffective. Dry skin had suggested hypothyroidism as a possible underlying condition, and thyroid tablets were given. The patient improved and remained free from the attacks.

CASE III.—A. F., male, aged sixty-five, came with a patch of lichen simplex on the back of the neck. He also complained of an itchy, uncomfortably chilly feeling all over the body, and of sleeping badly. The local applications improved the patch of lichen, but had no effect on the generalized pruritus. The dry, chappy and slightly exfoliating condition of the skin all over the body suggested a possibility of hypothyroidism. The administration of one grain thyroid tablets brought about lasting relief from the general pruritus, the improvement in the condition of the skin, and still more markedly in the general feeling.

CASE IV.—Miss L. P., aged eighteen, came with a severe case of alopecia seborrhœica of the scalp, a condition which had been slowly developing from early childhood. The seborrhea was of a marked, dry type, with the sebaceous plugs filling up the follicles. The skin of the whole body was dry, scurfy, and presented on the extensor surfaces widely distributed lesions of lichen pilaris. The patient was complaining of chilliness, weakness and general malaise. Hypothyroidism was suspected. Under pluriglandular medication and local treatment, not only the local condition but also the texture and nutrition of the skin of the whole body, as well as the general condition, steadily and markedly improved. After one year of treatment and medication, alopecia of the scalp and the general bodily condition showed a striking improvement.

CASE V.—L. P., male, aged ten, inmate of an orphan asylum, undersized, dwarfed physically, with a senile look, came with a disseminated ringworm of the scalp. After x ray epilation the ringworm lesions cleared up, but the hair came in very slowly, in some parts sparse and decidedly grayish, instead of the original black color. In a search for the cause of malnutrition a general examination of the body was made. A mild degree of ichthyosis on the dorsal surfaces of the hands and knees was found, also numerous lesions of lichen pilaris on the arms and thighs. The whole skin was dry, chappy, slightly thickened, and faintly desquamating. Hypothyroidism was reasonably certain, and hypopituitarism was suggested by the retarded growth. Under pluriglandular medication, combined with local treatment, the skin and general condition showed a slow but steady improvement.

CASE VI.—Mrs. N. S., aged thirty-six, married, gravida in sixth month, complained of an intolerable generalized itching of a few weeks' duration. Two months previously she had had influenza. The examination showed numerous dry, discrete, non-inflammatory papules scattered over the trunk and the limbs with a predominance on the extensor surfaces. Clinically, the case impressed one as a papular form of dermatitis herpetiformis, or one of the toxic dermatoses of pregnancy. However, the unusually dry skin and the statement volunteered by the patient that she had difficulty in perspiring, suggested a possibility of hypothyroidism as the underlying factor of the skin condition. Thyroid tablets, one grain each, three times a day, together with the local application of liquor carbonis detergens, had a striking effect. The pruritus cleared up in two weeks, and the patient has remained well.

CASES VII and VIII.—A girl of ten and a boy of twelve, cases identical in type and similar in distribution. Both had dry papular eczematous patches on the face, the girl for eight years and the boy for five years, practically without changes or remissions. The girl had also had numerous large papules, suggesting prurigo somewhat, mainly on the extensor surfaces of the limbs. The features, unlike an ordinary eczema, were the persistently dry and stationary character of the patches, and their discrete type and lack of tendency to run together and form diffuse ill defined areas. The boy also had a perceptible thinning out of the outer third of the eyebrows. Both patients improved greatly on the combined treatment of thyroid and local application, while the local treatment alone had only slight and temporary effect.

CASE XI.—L. M., male, aged sixty-three, came to the clinic, complaining of itching all over the body for the past several months. Inspection showed the whole body, including the head, covered with scratch marks and excoriations, partially suggesting scabies or pediculosis, and still more the combination of both these conditions. A possibility of senile pruritus was rejected, as the skin did not present any atrophic changes. Then two pediculi were observed walking on the back of the patient, and this misled me into the adoption of the first provisional diagnosis—pediculosis corporis combined with scabies. However, the routine antiparasitic applications had no effect, and for two months the patient showed practically no improvement. Atypical dermatitis herpetiformis was then considered, but Fowler's solution gave no results. In search for a diagnosis the patient was reexamined, and two symptoms were detected which threw an entirely new light on the case: first, dull and sluggish mentality, and stolid, slightly puffed up habitus of the patient; second, a marked alopecia of the outer third of the eyebrows. Hypothyroidism was strongly suspected, and thyroid tablets given. A marked and steady improvement at once set in. Three months later the patient looked better than at any time since the beginning of the observation. This is an interesting case, showing how easily one may be misled by a false clue in diagnosis.

ENDOCRINOTHERAPY VERSUS OTHER METHODS OF TREATMENT.

The final estimation of the relative value of endodermatology cannot at this early stage of its development be attempted even tentatively. However, its general position can be stated even now. Various methods of systemic control of dermatoses in use at present, such as vaccines, anaphylaxis food tests, autogenous serum injections, nonspecific proteid treatment, are all based either on a hypothesis or a deductive principle of a purely speculative nature, or, at the best, are resting on the concrete foundation of a few empirical observations from which a deductive theoretical principle has been evolved. Unfortunately, not one of these methods has proved uniformly successful. A principle demonstrated by the basic empirical observation could not be successfully applied on many clinical phenomena apparently of identical nature. This has been the main stumbling block and the main limitation of these methods, yet they are accepted as being legitimate and of sufficient scientific accuracy for clinical purposes. Endocrinology offers as much, at least. Its deductive principles are built on a rock bottom foundation of empirical observation. The basic endocrinous dermatological syndromes of myxedema, hyperthyroid skin, Addison's bronzelike dyschromia, acromegalia and adiposogenital dystrophia, are as concrete, definite and conclusive as any used in clinical medicine as the bases for therapeutic utilization. The system of theoretical hypothesis and clinical research built up on the foundation of empirical data is as fascinating, comprehensive and plausible as any of the scientific hypotheses and methods used in clinical research. This being so, I firmly believe that endocrinology should be incorporated into the dermatological armamentarium as a scientifically valid method of great clinical efficiency, even at this early stage of its development, and of unlimited therapeutic possibilities in the future.

SUMMARY.

In the final analysis of the clinical and theoretical data presented, the following deductions seem to be justified:

1. Endocrinotherapy can be accepted as the method scientifically valid and clinically effective.
2. Hypothyroid dermatoses are the most definitely established and therapeutically successful group.
3. To the hypothyroid group can be assigned, apparently, the following dermatoses: a. Various forms of dyskeratosis: ichthyosis, congenital keratodermias, Darier's kerosis, lichen pilaris, Darier's keratosis follicularis. b. Certain dry squamous eczemas and certain cases of psoriasis, Hebra's prurigo, senile pruritus and hypothyroid pruritus, possibly scleroderma.
4. Indirectly and nonspecifically various hormones are beneficial in various symptomatic dermatoses, such as acne vulgaris, rosacea, dietetic and vasomotor dermatoses, and diabetic eczemas.
5. The substitution principle of endocrinotherapy, i. e., the supply of deficient or absent hormones, at present is the most productive and clinically most applicable.
6. The best results are obtained by the administration of small doses for a prolonged period of time.

BASAL ENDOCRINE THERAPY.

By JOHN J. McNULTY, M. D.,
New York.

"His (Galen) keen appreciation of the unity of the organism, and of the interdependence of its parts; his realization that the vital phenomena (physiological and pathological) in a living organism can only be understood when considered in relation to the environment of that organization or part. What Galen combated was the tendency, familiar enough in our own day, to reduce medicine to the science of finding a label for each patient, and then treating not the patient, but the label. . . . the dangers which would beset the medical art if it were allowed to fall into the hands of a mere crowd of competing specialists without any organizing head to guide them."—A. J. Brock's *Galen*, 1916.

This, it seems, is the present danger from a "mere crowd of competing specialists." Endocrinology and endocrine therapy is dangerously beset, at present, with self-labeled endocrine specialists who are placing an atmosphere of vaudeville over this recently revealed domain of research—a domain that is not only new but has possibilities of demonstrating a new and greater service to the diseased.

"Not only do animals know the food that will suit them best, but they find out the most suitable remedies when they are ill, and constantly form a correct diagnosis of their malady with a therapeutic knowledge which they cannot possibly have acquired."—Butler's translation from Van Hartman.

Basal endocrine therapy, to be the employment of present day means to help the disordered or diseased, must consider basically the organism not only as a whole but in its relation to environment. To recur to our thematic note—the organism in perspective—biological perspective; and biological perspective includes and is dependent upon environment to give true values.

We seem to be coming into a recognition of an unconscious knowledge which is more knowing than our conscious deliberation, and upon this unfolding and higher sense of truth and law, we shall find a higher, truer, and more serviceable therapy. We shall depend upon organic selection instead of gratuitous interference—gratuitous interference which summarizes much of our present ignorant therapy. Unconscious knowledge is the perfect law of internal environment in its play with self and its interplay with external environment—psychophysical man and his environment. In our ignorance we have been interfering too much. Let us alertly observe, and alertly cooperate, but not interfere. Basal endocrine therapy is based on a working degree of consciousness—biological consciousness—a consciousness that has a sense of values and does not confuse the part with the whole. Our present sense of endocrine therapy seems only an expression of partial knowledge of values and relations. That which some modern psychologists call unconsciousness is, in reality, intimations of the only consciousness; that is, unconscious knowledge. Working forms of thought, such as classical endocrine syndromes, are serviceable if placed in their proper relation to the whole—the biological whole, so far as understood.

To us the error, and the danger, of holding to fixed concepts—classical endocrine syndromes—is that the fixed concept is not the fact in the condition—that the obvious is not necessarily the actual cause of the morbid phenomenon. The fixed classical endocrine syndrome called Graves's disease is not necessarily a primary thyroid disorder or disease. The gratuitous—and generally inaccurate—differential classifications of the organism's imbalance into such terms as Graves's disease, myxedema, acromegaly, Addison's disease, are not only gratuitous but inaccurate if treated with this partial concept.

Those obsessed with a desire to create and establish a fixed, definite differential endocrine pathology will sooner or later find themselves bewildered and enmeshed in their own weaving. Endocrinology and endocrine therapy can become logical and serviceable only to the degree that the so-called practicing endocrinologist holds clearly the biological concept of the unity of structure and unity of function in man (organism) as a functioning whole.

Therapeutically considered there are no endocrines—the endocrines are the endocrine—automatically reacting (unconscious knowledge) as an interrelated and interdependent, organic regulation—internal environment reacting with external environment. Classical endocrine syndromes are quite all right if we understand the partialness of the phenomena as guides to helpful diagnosis and therapy, but they are certainly dangerous if accepted and acted on as the whole of the disorder or disease.

"... Many men of the highest eminence are only partially educated." Morley Roberts, 1920. I fear this is true of many of us. When we try to press our partial knowledge into a fixed classical mold and to affirm its perfection and completeness, we seriously err. Plasticity is man's only hope. "A very slight study of the history of science reveals, however, that the problems which are incapable of solution receive it before the ink of the incredulous is dry."

One of the many reasons why classical endocrine syndromes should not be held in the thought of the therapist as a complete or true picture, and treated as such is that "no case can be prejudged from observations made in any other case. Every case is peculiar."

We differ, basically, with those who seek to establish classical endocrine syndromes and a definite meaning to classical endocrine syndromes. We have been, and conspicuously are at present, juggling with words, synthetic terms, vaudeville dramas. Such biological facts as stand revealed are our only guides to diagnosis and treatment of so-called endocrine disorders or diseases.

Classical endocrine syndromes are misleading if we place reliance on them as definitely understood single or partially grouped endocrine gland disorders or diseases. A thyroid imbalance usually indicates an ovarian disturbance as well, and a thyroid and ovarian imbalance indicates an imbalance or disturbance in all the endocrines now supposed to constitute the endocrine cycle—the interrelated and interdependent reactions of the autonomic mechanism—organic regulation—a human organism biologically understood.

Asclepiades "bids us to distrust our senses." This is peculiarly true when classical syndromes ask recognition. Basal endocrine therapy, we affirm, is based on what Galen called "Nature's faculties of attracting what is appropriate." This statement of Galen epitomizes our idea of basal endocrine therapy. It would seem better for society, *en masse*, that present day therapy return to some of the visional understanding of such early Hellenic physicians as Galen.

The modern biological therapist, the helpful therapist, sees more of duty than of technic—more of cause than mere effect. The practical modern endocrine therapist is quite familiar with and quite master of the technic of differentials, but while using his technic he is not hindered, mystified by the obvious alone. Where we have failed is in treating the obvious alone.

Modern endocrine therapy must consider the whole organism—consider internal environment and its reactions with external environment. A practical, simple working concept must be held as to the ever operative law of repair within, and as part of the organism's potential resources. We must work with organic regulation and as organic regulation works. Endocrine therapy, sufficiently understood, is the best means of working with organic regulation and its law of repair and maintenance.

"Merely give Nature a chance and most diseases will cure themselves."—Hippocrates (Fifth century, B. C.). We must look back to the visional utterance of such as Hippocrates, as well as to the man of vision of today, that we may escape the errors of superficial and inaccurate concepts in the treatment of disorders.

No matter whether we wish to or not, we are going to be forced into more rational and successful therapy through the rapidly increasing intelligence of the so-called laity. The people are going to leave us and go to so-called cults, unless we can render better and more permanent results from our therapy.

Writing of Hippocrates, Dr. Brock states: "His (Hippocrates) keen sense of the solidarity (or, rather, of the constant interplay) between organism and its environment." It is this "interplay between organism and its environment" that modern therapists must seriously consider if they would use endocrine therapy helpfully.

Let us consider the unwisdom and the disaster of treating classical endocrine syndromes as detached, local, and definite and pathological entities.

In viewing organic unity we do not lose sight of the importance of its constituent parts, but desire to call attention to organic unity as a basic concept, and then to consider, in their proper relation, constituent parts. This is particularly applicable to our thought concerning clinical endocrine syndromes.

Classical endocrine syndromes are to us but "the tyranny of names." They form too definite concepts to be accurate, and too definite a therapy to be curative. Endocrine syndromes, as we have stated before in this article, are not entities but complexes that are read differently by different observers.

We would like to quote here Arthur John Brock, M. D., of Edinburgh, 1916: ". . . We are all acquainted with the medical man to whom a name

(such as, let us say, 'tuberculosis,' 'gout,' or 'intestinal auto-intoxication') stands for an entity, one and indivisible, to be treated by a definite and unvarying formula."

We have been taking the stand, with clear confidence, that there are no such entities as tuberculosis, rheumatism, etc., *ad infinitum*, but that these so-called entities are but objective radicals of a basic disturbance of metabolism—an imbalance of the entire endocrine cycle functioning.

"What, now, is this 'Nature' or biological principle . . . which . . . is constantly overlooked—if indeed ever properly apprehended—by many physiologists of the present day? By using this term Galen must imply that, when we deal with a living thing, we are dealing primarily with a unity, which, *quâ* living, is not further divisible; all its parts can only be understood and dealt with as being in relation to this principle of unity. Galen was thus led to criticize with considerable severity many of the medical and surgical specialists of his time, who acted on the assumption (implicit if not explicit) that the whole was merely the sum total of its parts, and that if, in an ailing organism, these parts were treated each in and of itself, the health of the whole organism could in this way be eventually restored."

We are at oneness with Galen in his idea of unity—the organism as a whole—so far, at least, as therapeutical approach to organism is concerned. Our sense of present day endocrine therapy is not its relation to classical endocrine syndromes, but its scientific and demonstrable value in the treatment of basic metabolic errors, which assume varying endocrine syndromes—individual variances from type.

We wish to state here that our belief is that obvious endocrine disorders or diseases indicate involvement of the whole endocrine cycle or mechanism; therefore the logical basic treatment of endocrine disorders or disease is the employment of associated endocrine gland substances—all endocrine substances in biological association—and allowing the only law, the law of organic appropriation, to function; that is, the law of unerring selection—the activity of unconscious knowledge.

"Galen expressed this idea in the unity of the organism by saying that it was governed by a *Physis* or *Nature*, with whose 'faculties' or powers it was the province of *Nature* lore to deal."—Brock. We affirm, with Galen (*vision*) that it is with "Nature lore" that the enlightened therapist deals. We are commencing to catch glimpses of the consciousness of internal environment, internal organism and its every endeavor to express total balance in its total reactions—internal environment reacting to external environment—a phase of "the Immanence of Health."

"The living organism is a creative artist. This feature may be observed typically in its primary functions of growth and nutrition; these are dependent upon the characteristic faculties or powers by virtue of which each part draws to itself what is proper or appropriate to it, and rejects what is foreign, thereafter appropriating or assimilating the attracted material."

This is the whole and basic biological principle

on which associated endocrine substances are given. Nature, or the unerring law of organic selection, knows what to select, and only Nature, organic selection, knows. Selection—organic selection—is this faculty potential. "But the more we learn about the delicacy and complexity of the regulating processes, the more definitely does a difficulty appear."—John Scott Haldane. Let us recognize this "delicacy and complexity" enough not to ignorantly embarrass it with treating it as classical endocrine syndromes.

We are commencing to think in terms of function rather than structure, for an understanding is occurring in us that function, physically considered, is life, and that structure is but an incident of function. It is clear to us that no one is qualified to practise endocrine therapy who has not at least a certain amount of biological understanding of organism as a unified phenomenon or function.

We hope that endocrinology and endocrine therapy will not become a vaudeville, but it will become a vaudeville unless we properly appraise the value of the activities of the vaudevillists—the superficial activities of the superficial. • Biological understanding and biological therapy—scientific endocrine therapy, is here and will abide. As vision comes to earnest and qualified researchists, we all will partake of the reflected light and work in fuller light—a light in which we shall not stigmatize our fellowman with fixed and fatal terms—classical endocrine syndromes.

We are now treating successfully, as intelligent cooperators with the inherent law of repair, conditions we "diagnosed" as hopeless, fatal. This is largely the result of more biological understanding—catching glimpses of how Nature works, and co-working with organic law.

"The researches of the anatomical school of Alexandria had been naturally of the greatest service to surgery, but in medicine they sometimes had a tendency to check progress by diverting attention from the whole to the part."—Brock's Galen, 1916.

"That the best physician is also a philosopher." While this was true in Galen's times, we can now say that the best physician is also a scientific philosopher. Without the urge of scientific philosophers, there would be no real research.

We must use the "Mind's eye as an aid to the physical eye."

We take definite and decided issue with the statement that introduces an article on endocrinology in a recent issue of the NEW YORK MEDICAL JOURNAL, which reads: "Endocrinology is the study of diseased functions, etc., etc." Endocrinology is not the study of diseased functions. It is a study of the phenomenon of health, in which study deviations from the normal are noticed and placed in their right relation to normal function.

It is this obsession to think only in thoughts of disease rather than holding the normal in thought that has been the Nemesis of medicine, and which is driving the so-called laity away from us to so-called cults. The laity are rapidly discrediting the disease-monger.

"Life manifests itself in two ways—as structure and as activity. But we also recognize . . . that

this is living structure and living activity. Each part of the structure bears a more or less definite spatial relation to the other parts, but it is actively maintained in that relation." Between organism and environment a constant active exchange is going on. But this exchange, in so far as it has any physiological significance, is always determined in relation to the rest of the living activity of the organism. "The living body and its physiological environment form an organic whole, the parts of which cannot be understood in separation from one another."—Haldane.

How long will it be before the practical practising physician will understand this basal fact? He certainly cannot be a serviceable therapist until this truth is understood and demonstrated in his clinical work.

17 EAST FORTY-SECOND STREET.

Treatment of Hiccough.—G. Leven (*Presse médicale*, December 29, 1920) recommends lying face down on the floor as a measure for arresting hiccough. In illustration he cites the case of a patient who had had hiccough for three days and in whom a variety of well known remedial procedures had failed. A few minutes after he had been told to lie down face downward he left the office wholly relieved. Frequently it is advisable also to reduce the irritability of the gastric mucous membrane by prescribing two grams of sodium bromide a day in divided doses after meals as well as one tablespoonful every two hours, five or six times a day, of ten grams of bismuth subcarbonate and twenty grams of acacia in 300 mils of sterile distilled water.

Hemostatic Agents.—P. Emile-Weil (*Bulletin de l'Académie de médecine*, March 1, 1921) notes that certain substances, such as emetine, while actually possessed of hemostatic activity, do not appear to act either through vasomotor change or modification of coagulability. Blood serum reduces the delay in the coagulation of hemophilic blood *in vitro*; it acts similarly when injected subcutaneously or intravenously, and at the same time lessens the manifestations of hemophilia. A more important test is that of determination of the bleeding time. The blood flowing from a small incision in the lobe of the ear, when wiped off every thirty seconds, normally continues to exude for three to three and a half minutes. In all chronic hemorrhagic states this bleeding time is increased to from five minutes to two hours. Cases in which the bleeding time is persistently between ten and fifteen minutes are particularly favorable test objects for the study of hemostatic agents. The vasoconstrictor agents such as adrenalin reduce, and the vasodilators such as amyl nitrite increase, the size of the drops which exude, but neither of them alters the bleeding time. Coagulant agents, on the other hand, produce a definite effect on the bleeding time, some immediately and in a lasting manner, like pituitrin, others more slowly, including blood serum and human blood injected under the skin or administered by transfusion. Emetine, while seemingly acting neither on the vessels nor on coagulability, likewise reduces the bleeding time; hence its use is justified. Studies of the blood platelets are greatly to be desired.

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Collectanea

Flies as Distributors of Intestinal Protozoa.—Since the classic positive demonstration by Smith and Kilbourne that insects may be instrumental in the transmission of disease, the house fly has often been accused of being one of the disseminating agents (*Journal A. M. A.*, June 4, 1921). Today this familiar insect pest stands not only accused but also repeatedly and convincingly convicted of the serious charge. The association of the fly with pathogenic bacteria is frequently pernicious to public health. The microorganisms of suppuration, the germs of typhoid, cholera, dysentery and tuberculosis, not to mention others less prominent in the public mind, have been detected in league with this omnipresent insect traveler. The incrimination that epidemics may be brought about through the dissemination of infectious material by flies has repeatedly been sustained. How persistently they may harbor the sources of danger is shown, for example, by Ficker's observation that flies fed on typhoid cultures may still give off the bacilli twenty-three days after infection. Heretofore the bacterial parasites have claimed foremost consideration in relation to the fly. But now a new menace looms up. Root, an entomologist of the newly established School of Hygiene and Public Health at Johns Hopkins University, has demonstrated the possibility of a hygienically undesirable association between flies and intestinal protozoa, including the genus *Endameba* of unsavory reputation. Fortunately, the free forms ingested by flies are apparently killed within an hour without encysting. But cysts of the intestinal protozoa survive much longer in the bodies of flies. According to Root, flies feeding on a human stool containing cysts or free forms of intestinal protozoa

will take large numbers of them into their intestines and deposit them again in their own feces. Since all stages of the protozoa are killed within a few minutes by drying, such fly feces are dangerous to human beings only when deposited on moist or liquid foods. A fly which has once ingested fecal material containing protozoa may deposit feces of its own which contain the infective forms of the protozoa at any time from a few minutes after feeding until the most resistant forms, the cysts, are dead. The deposited cysts of amebas may survive as long as two days under favorable conditions. These experiments emphasize anew the importance of flies as carriers of disease producing organisms from human feces to human food.

The Significance of the Bacteria Found in the Throats of Healthy People.—Arthur J. Bloomfield (*Bulletin of the Johns Hopkins Hospital*, February, 1921) made frequent cultures of six healthy individuals' throats, covering a period of from one to three months. The organisms present were divided into two groups, the true normal flora including nonhemolytic streptococci and gram negative cocci, and pathogenic or nonpathogenic organisms which are accidentally introduced and are present usually only a short time in a given individual.

Scepticism as a Freudian Defense in Reaction. **A Psychoanalysis of Bazaroff, the Hero of Turgenev's Novel, Fathers and Sons.**—Jackson Edmund Towne (*The Psychoanalytic Review*, Vol. VII, No. 2, 1920) shows how truly Turgenev has analyzed the neurotic Oedipus complex in a son in this fictional character. He shows the typical irritated, antagonistic attitude toward the superstitiously credulous mother, which is an indirect and overcompensating result of the unconscious fixation. His complex leads him to become the nihilist and to manifest indifference and positive contempt toward his parents. He gives evidence also in love and in his conscious memories of childhood that his libido is checked or warped by some fixed neurotic attitude, though his defense forbids any keen consciousness of what his childhood memories associated with this were.

Is Sprue Endemic in the South?—Mark F. Boyd (*Southern Medical Journal*, April, 1920) believes that the evidence advanced by Ashford that the specific yeastlike organism, *Monilia psilosis*, is the cause of sprue appears conclusive. Manifestations suggestive of sprue may be observed in persons who have never been outside the United States, and from these persons Ashford's monilia may be recovered. Sprue, by reason of the disability it produces in the tropics, is of distinct public health importance. Its importance in the southern United States is as yet undetermined. Potentially it may equal hookworm disease or pellagra, so every effort should be made to ascertain its incidence and present its characteristics to southern physicians. Our knowledge of its means of transmission is nil, but from the situation in which the organism can be demonstrated, it would appear that measures designed to reduce contact and promote proper disposal of excreta might be of value in its control.

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Modern Commentaries on Hippocrates*

The Humoral Theory and Its Application

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The difficulty the modern essayist has in commenting on the writings of the ancients may not always be due to their obscurity. I realize, as I engage in it, the force of the hint Goethe threw out to his critics, that possibly the light burns dimly with me. Miss Miliona started a thrift class when she heard her father, the steel magnate, say what we needed was more labor and less bread. When we wanted peace a master of motors chartered a ship and went after it. When a foundryman and a politician entered literature, they started in to reform the English language. When a weaver found his purse fuller than his time, he began to show the farmer how to milk his cows and plant his potatoes. When a doctor devoted to mortality statistics got the chance he wrote an essay on immortality. There ought to be a field, free for all, reserved for the aberrant industry class in the world's exposition, but even this should be entered by the dry goods expert, interested in artistic architecture, or the soap boiler devoting his last years to poetry, hat in hand and with moveable joints in their spines, characters not acquired by men accustomed to the adulations extracted from a world grovelling at the feet of material success in life. Attempting to keep full in view certain lessons to be garnered from the later life of more distinguished men, when a medical man, though in no way handicapped by materialistic laurels but no longer even politely referred to as middleaged, enters the field of historical criticism, he should first look carefully around him and see who is occupying it and commune with himself as to whether he belongs there. In their new activities it has not been observed that the gilded girl or the foundryman or the politician or the weaver or many another took these precautions, deeming success a matter of course in any of their undertakings. At least he need not add unnecessarily to the gaiety of his own critics by a blindness which seems usually really to arise as much from an insufficient sense of humor as from the acquired characteristics

of persons having attained eminence in fields they have cultivated in earlier years.

All of which admonishes me I have reason to be cautious in differing a little in sentiment from that which one sometimes notices in literature old and new, to the effect that the modern student of the history of medicine, much less the casual reader, can not enter profitably into the field devoted two thousand years ago to the husbandry of philosophy and medical science. I presume from the viewpoint which some critics hold there is a modicum of truth in this. I think it very likely impossible for any one, however studious and however well equipped otherwise, ever completely to grasp or thoroughly to enter into the manner of thought of the ancients, or for that matter into the atmosphere of thought pervading epochs less remote than the term, ancient philosophy, connotes. It is certain one can never be sure that one has really penetrated the inmost recesses of the ancient mind, however assiduous one's study of it. These things may be freely granted. At least it is as impossible to deny them as to prove them. I humbly question, however, whether this is the only viewpoint from which a survey can profitably be made of the beginnings of the history of science. All history, it is said, must be written anew for each generation and the force of the remark is obvious. Each generation taking up its own angle of incident vision and seeking only the lessons it thinks important in history necessitates a continual shifting of the facts in and out of the limelight. That this usually results in the abolition or rather oblivion to the appreciation of the way they were presented to former generations also has its interest for us.

In so far as historians, skilled in the art, make a pretence of furnishing eternal, snow white truth, without fleck or blemish, to a properly obsequious and receptive world, eager for the news from the inmost Olympian circles, I suppose we must acknowledge that such sentiments are correct, but I doubt very much if all the terms of this high ideal are tenable, as sometime expressed. One naturally

*I have used the translations of Adams into English and the French translation of Littré for Hippocrates and Kühn's edition of Galen.

falls into this attitude, when one is too deeply imbued with the self-consciousness of modern science from a wide acquaintance with its literature. I read only yesterday the approving citation of a reviewer, who yielded, coyly perhaps but with graceful readiness, to the bold assertion of an author, whoever he was, that it was false modesty not to assert that all the secrets of nature had been revealed in the processes of a certain disease, or was it some other repositories of Nature's mysteries? It is not well to be too specific about author or reviewer. I only wish to illustrate how easy it is for these gentlemen, for all of us indeed, who linger on the outskirts of things, to absorb some of this spirit in the study of modern medical literature. But is there not something, is there not some grateful thought we can derive from only a proximity to this luminosity of our times without unfortunately encountering its full glare? Is indeed after all the impression general in science, even in medicine, that we know it all? Are there not some at least who are grateful for half truths? These questions are natural in this connection and for me at least are all important.

VALUE OF ANCIENT THOUGHT.

If these are considerations to ponder as to the historians' audience, there are parallel ones not less important as to his work. Even if it is true, and I believe it is true, that it is quite impossible to fathom all the depths of ancient thought, can we not get flashes and gleams of hidden meanings, of meanings at least for us even though false interpretations, that will act as a stimulation to modern thought? Was it Browning or some other cryptic philosopher who, asked what he meant by such a line, answered complacently he was blessed if he knew what he did mean. It was of no consequence. The important thing was to know what it meant to the reader, if anything. It is not of prime importance for us to know what Shakespeare or Homer, Heraclitus or Hippocrates really meant by some cryptic line. What is there in it for us? From Aristotle and Plato we can not hope to derive what it was possible for their contemporaries to learn, nor what the next generation gathered, nor the next and so on for sixty or seventy generations, but it has meant something to them all and be sure it can mean something to us. Otherwise the good they did would lie buried with their bones, but we may equally be sure it was not absolute truth even at the start, not such as modesty can be too modest in concealing. And this abnegation of absolute truth which we make in the face of history, the continual revival of interest from a new angle, this gain of a new point of view from which to behold the panorama and speculate as to its interpretation, has in fact been, with no attainment as yet of absolute truth, an ever ready source of charm and interest for thoughtful men throughout the ages. Without this eternal resurrection, without this new point of view, we should care no more for history than we do for a catalogue of the stars. New ones are discovered, of course, but they have no interest for the public. This can hardly be otherwise in the history of science for scientific men in general. Continually exhibiting new facets of absorbing interest

to the intelligence of the modern worker as he meets facts in his own work new to him, the critical survey of the past, with its incidental reminder that there were brave men before Agamemnon and wise men before Solon, can not fail to be to him a subject of interest and profit, if he will heed. Those gleams of light we get from it may not be such as they existed for former generations. They may not be such as will shine in the future, but this does not wholly destroy the value they have for the present, differing in each it may be and even always wide of absolute truth, if any one knows what that is.

So long as we make no pretence, then, of farming or of reforming the English language, no promise to bring peace to a world in arms, no threat of printing posters to enlighten the poor as to thrift, in so far as we take care not to raise hopes in our readers, which are bound to disappoint, so long as we patiently and cautiously keep hidden the conviction that we possess the well springs of eternal truth, so long as we humbly, manuscript in hand and with many reverences, bow to the editor, who is the best judge what it is practicable, even what it is best for his multitude of urgently exigent readers to read, I think we can still sleep o' nights even in proximity to our neighbor exulting in the possession of everlasting truth. I for one feel that I don't need to worry about it, it being no possession of mine. I am content to leave it to those who rejoice in it. I am content with the impression ancient literature makes on me and if I try to hand it on, such as it is, soiled as it is with my own sordid grasp of it, and the editor gives me a chance, why should I stay my hand because I know it will all be dust and ashes, while the works of genius are immortal? It was not the dream in the old temple slumbers that mattered, it was the interpretation the artful priest of Aesculapius put on it that decided the therapy the patient adopted. This is the sordid grasp to which I refer, having here particularly in mind somewhat I confess the peril of introducing too much of the personal element in formulating the general principles of the humoral theory, which was the subject of the last essay in this journal. It is desirable in the exposition of a theory which had such far reaching effects on the course of the evolution of medicine, not to be content with this personal interpretation but to illustrate it amply at its inception and in its first developments.

TEMPERATURE CHANGES.

Having referred particularly to Hippocrates's great appreciation of season, climate and weather upon man in general outline, it remains to point out the specific manifestations of his convictions in the genuine books of the Hippocratic Corpus. Naturally one first turns to the *Airs, Waters and Places*. It opens with a recognition of the influences of temperature changes in a general way on the system and then specifically we find it explaining that there are waters which are of a heating nature, some having a solvent effect on the bowels, being adapted to boiling but some are intractable and dry up the bowels. At once we grope, quite as admitted in my preceding remarks, but we see the association in the mind of Hippocrates of water both with the dry

and the moist state of the bowels and we learn that to some extent the qualities of an agent are determined not by its own physical condition but by the effects it has on the human system so far as it is classified in the humoral theory. This gives us some enlightenment on how it was possible that a theory so incongruous with all we regard as common sense could appeal to such a mind as that of Hippocrates, ever ready to rebel at any violation of it. In the *Ancient Medicine* he thus attacks its special application. Let a man, he says, of a weak constitution "eat wheat such as the threshing floor supplies, raw and unprepared, with raw meat, and let him drink water. . . . He will experience pains, his body will become weak and his bowels deranged and he will not live long. What remedy? Hot? Cold? Or moist or dry?" Not at all, he answers; change his diet. As far as he knew none of these qualities ever existed alone but always mixed with others, whether we consider them, I suppose, from the physical or the therapeutic viewpoint, but he jumps the later limitations of the theory altogether when he says that in pneumonia, there is something beside the hot mixed with it—the bitter, the salt, the acid perhaps.

TISSUE CHANGES.

He refers to waters which generate stone in the bladder, in such a way, we perceive in the *Airs, Waters and Places*, that there is a connecting thread to the thought we meet in connection with water. Our conception of inflammation has become so largely one of tissue structure and tissue change, it has become so much more associated with its varying etiology, we forget it is but a short time since it was almost exclusively a dynamic conception, one almost entirely symptomatic. For the old physicians it was so exclusively. The sensation of heat in the inflammations of the bladder had a literal connotation for the ancients to a degree foreign to us. The burning sensations in the urethra were real heat. In Hippocrates's view the cause of stone in the bladder was indubitably traceable to the water habitually drunk. Stone in the bladder was accompanied by heat. Water, he thus demonstrates, though cold and wet by nature, gives rise to heat. Thus runs the thought apparently. We see at least that water was heating, of a hot nature in connection with the symptoms.

So when "winter is dry and northerly and the spring moist and southerly, the summer will be of a febrile character," ophthalmies and dysenteries will prevail; it is the fever or the burning or the smarting of these generated by the moist spring weather, preceding the advent of summer, which makes them hot. Here we see certain agents, certain elements, the water and the air, working by contraries, but cross purposes are not the rule. Women are referred to, not only as moist and soft, but as having a cold and relaxed belly. It would seem then that some of the idea of the warm we found connected with inflammations is also inherent in the figure of speech as to sexual appetite, the men being more ardent and hence warm by temperament, the women colder. "The dysenteries are also likely to occur in women and those of a humid tem-

perament." The lack of musculature, the pliable skin, the substratum of adipose tissue we recognize as lending to the ancient mind the idea of moisture in women and children and those of flabby flesh. Soft clay, moist and cold, unbaked by heat, seems to have been the mental association. Dysenteries and violent diarrheas drain the moisture away in their copious stools and leave the plump figure of yesterday a wasted and shrunken frame. I do not know if modern statistical information or even if the impression of modern clinical experience confirms this idea that the plumpness of women and children or the flabbiness of ill nurtured males predispose to diarrheas and dysenteries. In the latter instance perhaps flabbiness and the diarrheas depend on a common cause of intestinal inefficiency, but I suspect the striking change wrought by summer diarrheas on the plumpness of women and children multiplied the cases in the mind of him recording a long clinical experience from memory without the help of statistics, at least in their modern profusion. At any rate, such things fell to the category of humoral theories. Men of a phlegmatic temperament, that is, those subject to catarrh of the upper air passages, "are like to have dysenteries too," perhaps especially when subject to stomach disorders as they sometimes are. There is trouble though for us about the brain; that like the phlegm which comes from it is cold and wet and the cold and wet of the weather increase it. Thus water or moisture we saw producing heat in stone in the bladder, working by contraries, here in the head works by similars. These two principles were as great a blessing to the ancient pedant as the ubiquity of bacteria is to his modern successor.

Why the phlegm is cold we perceive fairly well. Of the body fluids whose physical attributes, when they come under the notice of the observer, are likely to be associated with certain definite mental impressions it is the phlegm which most often leaves the impression of being cold and wet. The blood and the bile are warm when voided, while the phlegm, for long lying in the air passages before coming in contact with the skin of the examiner, is cold. Thus "some have catarrhs beginning in the head and descending to the lungs." It is the cold and wet phlegm for the ancient that caused lung trouble—and we don't form quite so coherent an etiological chain as this now, though we see the gaps in the old one.

CHANGES WITH AGE.

"Those are bilious who have dry ophthalmies from the heat and dryness of the flesh." The thought stands forth when it is at once mentioned in sequence that dryness and hardness of the flesh is connected with old age, for that is dry and hard too, if not hot; "the aged too have catarrhs from the flabbiness and melting of the veins." The cold and wet not seeming to fit in very well with the dryness of old age, there seems a faltering here, flabbiness also not being, it would seem, exactly consonant with the hardness of old age. In fact it is permissible to conclude that sometimes, at least, when we grope, there is an irreconcilable clash which no logic, ancient or modern, no diligence of

search along the mental track, entirely silences. It is a way theories have sometimes even in the best regulated eras, like our own, but it is unsafe, living in an era unsympathetic and intolerant of any logic but its own, to yield too readily to this facile interpretation.

The indications of the correlation of the humoral states of the body with the climate of different countries, of course around the Mediterranean for the most part, are too diffuse to lend themselves readily to citation, but permit the summary that the question of health and disease is inextricably involved in the interrelation of the qualities of the animal system with the characteristics of the weather and the seasons, of water and earth, in the terms of the humoral ideas prevailing in the genuine books of Hippocrates, but often as to the humors themselves this is not specifically avowed, even in this book of the *Airs, Waters and Places*. In the *Regimen in Acute Disease* we scarcely get a glimpse even of these ideas. Still less, if possible do we get any intimation of the qualities in the *I* and *III Epidemics*. In none of the foregoing is there any talk of the discrimination of the body fluids or any reference to the four humors as an exclusive class, etiologically or pathologically, but in the *Epidemics* there is frequent reference to the weather, the climate, and the location in consonance with the treatise we have had chiefly under consideration. Indeed the *III Epidemics* is divided into "constitutions" in which the chief etiological factors are these precisely and only secondarily the humors at all. The *Aphorisms*, some of which may have been independently composed by Hippocrates, some of which selected by him or by others from his genuine works, but some of them too silly and tautological to have been composed by anybody but a fool, exhibit many instances of the frank avowal of humoral doctrines. These are chiefly selections from the spurious books we have not yet paused to consider and therefore there is no reason for supposing the aphorisms, not traceable to either the genuine or the spurious books, are also from the hand of Hippocrates himself. In the *Prognostics* the best emesis is referred to as that which is formed of phlegm and bile, thoroughly mixed and much of the prognosis in pneumonia seems based on this state of expectoration, the yellow color of the sputum being thought of as derived from the yellow bile.

THEORY OF THE COCTION.

The acceptance of the importance of the coction, that is the process whereby the excretions of the air and food passages become loose and are easily voided, corresponding frequently with the crisis in pneumonia for instance, is an acceptance if not of the theory at least of a participation in the manner of thought of the humoralists. In the *Régime in Acute Disease* it is said: "Fasting itself sometimes attracts raw bilious humors to the head and the thorax and interferes with the coction by causing sleeplessness." Further along in this book we find the clue to the theory of the coction in its assimilation with digestion of food and drink, the lack of which also gives rise to insomnia.

In the *I Epidemics* in a persisting ophthalmia the

humor (of the discharge, I suppose, remaining ichorous) continued without decoction. And there were bilious diarrheas, "abundant, irritating, without decoction," sometimes even watery, and again we get the assimilation with digestive processes—but in everything pertaining to the disease there was much humidity, there was vomiting of phlegm and bile and food was returned from the stomach undigested. This coction of the humors is so intimately associated with the theory of crises and critical days, it is difficult to go thoroughly into the matter without going further than my remaining space allows.

There is reason for the remark that the chief internal etiological factors in the process of disease for Hippocrates are the bile and the phlegm, but especially the bile, as that occurs more persistently in the discourse than the phlegm. Littré draws attention to the fact that both the older philosopher Anaxagoras and the younger dramatist Aristophanes allude to the bile as the origin of disease, but Plato still younger, in the *Timæus*, which is supposed to have been written in his old age, probably long after the death of Hippocrates (or in his extreme senescence if we must accept the legends of his longevity) explicitly refers to the four humors as the causes of disease, when their equilibrium is upset by the predominance of one or the other. This matter has been alluded to in the previous paper and while the evidence as to the conclusions reached do not entirely conform to those demanded by the orthodox tenets of science, they are fairly within the usual limits of historical criticism.

It is of some significance in approaching the consideration of the full blossomed humoral theory, such as appears in some of the spurious books of the Hippocratic Corpus and such as Galen handed down to posterity, to note a few special indications which point to its origin in the Sicilian School. This also has been touched upon in the previous paper. From Sicily direct rather than indirectly from the Hippocratic Corpus we may imagine Plato derived his fuller developed humoral theories. In one of the fragments of Empedocles we find the declaration, often quoted by Galen, that the vine draws its characters from the soil. The fourth book of *Maladies* Littré places in a special class (VI) as continuous with several others all coming from some able follower of Hippocrates, before the time of Aristotle; Polybus, Galen thinks, perhaps. This brings it close to the date that I have alluded to for the *Nature of Man*, but from internal evidence, from a significant difference in the treatment of the humors, we infer it certainly is not from the same hand. The author of *IV Maladies* remarks how different are the lands lying around the Mediterranean in the virtues they impart to the vine. This took place, he seems to conceive, by virtue of a power, to which Hippocrates also alludes in *Ancient Medicine*, assimilable to the famed entelechy of Aristotle, so much exploited by Galen in antiquity and also by Driesch and the modern vitalists. The immediate point for us is: "Moreover there are four other sources by means of which each humor arrives at the body—". Those sources

are for the blood—the heart; for the phlegm—the head; for the water—the spleen; for the bile, the part which is in the liver. The food and the drink contain all the biliary, the water, the sanguineous and the phlegmatic elements, some less, some more.” In these origins and organs must exist powers which give them their characteristics. Of course whether it is the neovitalist or this ancient vitalist follower of Empedocles, from whom Aristotle borrowed so much, who begins to discourse on these attractive powers, so convenient for both alike, we advance not a whit, whether we call them entelechy or dynamics. This puerile logic, such as it is, we see disappearing behind Empedocles and the Sicilian school into the mists of the infancy of thought, unrefined by criticism, unfettered by reflection apparently.

In the *Nature of Man* and here also in the *IV Maladies* we find the authors, mindful of what Hippocrates had to say in the *Airs, Waters and Places*, also in difficulties with the details of reconciling all the facts of climate with those of the corporeal system of man. We notice here too the fire that burns the flesh in the humors of an eye afflicted with phlyctenæ and the advice to purge only the concocted humors. We must judge of the medication in disease by the revulsion obtained when the dry becomes warm and the moist becomes cold, for this is the true equilibrium of the qualities. The parable of the vine adopted in the *Nature of Man* runs thus: “What the earth is to trees, the stomach is to animals; it nourishes, warms, refreshes,” and this author runs into absurdities, which neither the author of *IV Maladies* nor, much less, the author of *Airs, Waters and Places* could be guilty of. In *The Humors* as in *The Aliment*, the confusion of language and of ideas often naturally suggests a student with his notebook following a lecturer, steeped in the doctrines of Hippocrates, it is true, but to which, as he dilates on the points in them related to the matter, the teacher adds his own prepossessions for the theory and such interpretations of it as are set forth in *The Nature of Man* and *IV Maladies*. These the note taker in *The Humors* and *The Aliment* sets forth with the usual half lights of the unflashed medical student, foreshortened, abbreviated and confused.

NUTRITION OF THE CHILD.

In the book on *Generation*, which opens the series, with the *Nature of the Child* and the *IV Maladies* following, all of which are supposed by Littré with every appearance of probability to be one treatise by one author, it is declared at the start that the sperm of man comes from everything moist in the body, being the most active part which is thus separated, the essence of the pangeneses of Empedocles(?), of Aristotle at least and of Darwin. Much citation of proof follows, which does not immediately concern us. In the nutrition of the infant in utero nourishment is drawn both from the food which the mother consumes and from the air she breathes. These are attracted, “by the power,” to the child just the same as the stomach absorbs its food, the head drawing to itself phlegm, the liver to itself bile. Here, as in *The Aliment*, air is a

food. Again in the *IV Maladies* we meet with the simile from Empedocles slightly altered. This second reference is to vegetables drawing their particular characteristics each from the soil, their flavor, I suppose. The seed or the grain swells with the air and the humors it draws from the ground. The force (the dynamics) in the humor condenses the most volatile¹ part in the seed. The confusion, I imagine, is in the thought, not in the language alone. Thus condensed by the humor and driven by the pneuma, the seed breaks forth, by virtue of the quality of its dynamics, into leaf and this finds for a while its nourishment from the burst seed itself. The comparison with the child in utero is most excellently worked out, but it is curious to see how the humors and the pneuma play their part in the animal as well as in the vegetable, true to the older pantheistic theory of primitive man, but true also to the terms of the newer humoral doctrine, the warm, the moist, the cold, the dry govern it all.

The text really here takes on an exposition which appeals to us, just as the argument must have appealed to the older Hippocrates, himself too cautious to stretch the theory to the breaking point, a catastrophe, as it appears to us, not avoided by the other authors, carried away by their enthusiasm for the neatness with which it sometimes works, perhaps. It suffices to exhibit how helpful a false theory can be, it is not necessary to show how seductive and misleading it becomes in the hands of those who deliver themselves up to it, typical fanatics in science, spellbound. The parallel reaches its climax when the author triumphantly declares: “Now I return to the purpose which has led me into these explanations. I say all vegetable productions live from the humor of the earth in a state corresponding to the qualities of that humor which the earth contains. So the child lives from its mother in the womb and in a state corresponding to the health of the mother. One may find a perfect similitude between the products of the earth and the product of men.” But his comparison is so successful that his elation leads him astray. He does not heed the wise man’s warning, *pas trop de zèle*. He forces the parable into applications less successful. In parturition the glairy and sanguinolent discharges come from the head, and the source of the blood in general, as today, is a rather complicated process, but evidently the heart and blood-vessels attract it from the food. It is the stomach necessarily that does most of this attracting and we infer the other organs—the head, the heart, the liver and the spleen when the water comes into play—are secondary attractions, the bile, at least in some accounts, being attracted by the liver from the blood. This to us is utter nonsense and chaos. I am not sure an unsympathetic analysis, such as I am making, would not reveal holes in modern physiology, but we will leave that for the amusement of future critics. They will have their share.

¹The hereditary parts of it settled in the seed probably by a sort of pangeneses, since this passage seems to rest on doctrines ascribed to Empedocles, who held them before Darwin and even before Aristotle, apparently. I do not think we can entirely identify “dynamics” with the modern germ plasma, though in this particular passage, the latter modern conception fills the vacancy here, which makes the trouble.

Lung Mapping by the Injection of Bismuth Mixtures in the Living*

By HENRY LOWNDES LYNAH, M. D.,
New York.

Accidental inhalation of bismuth mixtures has occurred at times while patients were attempting to swallow the mixture for a radiographic localization of an esophageal obstruction. Again, bismuth mixtures have trickled through a cancerous tracheoesophageal fistula mapping the bronchial tree (1). In cases of esophageal paralysis the mixture will not enter the esophagus at all, but will be held in the reservoirs of the pyriform sinuses and pour over between the arytenoids into the trachea, and also map out the tracheobronchial tree.

Since the report of Beeler's case, many similar observations have been recorded by such expert radiographers as Gottlieb, Hirsch, Le Wald and Stewart. The bronchial tree has been injected many times in the cadaver, but Jackson was first to recommend the insufflation of dry bismuth powder for localization of small foreign bodies not visible by x ray (2).

Bullock and Gottlieb (3) in an experimental study on animals injected bismuth and barium mixtures into the bronchi and obtained some very beautiful pictures. They were also able to study the action of the bronchi in dogs, and demonstrated a wavelike action in the larger bronchi and trachea.

It occurred to me that bismuth mixtures injected into the lung of the living patient would probably do no harm, especially in those subjects suffering from almost incurable diseases of the bronchi and lungs, such as bronchiectasis and pulmonary abscess; and furthermore, that these areas, which heretofore had never been mapped out, could be definitely localized by the injection of some opaque mixture bronchoscopically which would gravitate into the abscess cavity.

The following patients were injected bronchoscopically with an oily mixture of bismuth subcarbonate.

CASE I.—F. H., a man of twenty-six years, presented a lung abscess in July, 1919, after having aspirated sea water while in swimming. He got out too far and became exhausted and went under. He was hauled out and by first aid measures soon revived. One week later he suffered from what was supposed to be bronchopneumonia and there was much foul expectoration at this time. Within one month the acute symptoms subsided, but he continued to expectorate large quantities of pus. He was sent to New Platz, N. Y., with the diagnosis of pulmonary tuberculosis, even though no tubercle bacilli were found in his sputum. He had fever and also complained of having a bubbling sensation in his right chest. There were severe night sweats at times.

On February 10, 1920, he consulted Dr. F. W. Corwin, of Newark, N. J., who referred him to me for bronchoscopic examination. The radiographic

plates which Dr. Corwin had taken showed a definite shadow over the right lower lobe surrounded by "pus sponge soaked" infiltrated lung. The diaphragm was attached and pulled upward. The radiographer in his report stated that there was a level of fluid and gas bubbles in the abscess cavity. This, however, we were unable to interpret. There was profuse expectoration of foul smelling pus, and the patient stated that he had coughed up as much as would fill a large preserve jar every twenty-four hours, and that he had been measuring the amount of sputum for some time. He was bronchoscoped after a further study of new radiographic plates.

There was a profuse discharge of pus which poured out of the bronchoscopic tube mouth. It was very foul smelling and blood tinged. A seven mm. bronchoscope was introduced so that the lower lobe branches could be studied with ease. After thorough evacuation of the pus filled bronchi, the superior lobe branch on the right side was examined and found on coughing to be free from pus. There was some pus coming out of the middle lobe branch which was directly anterior, but after this branch was sucked out no pus was seen when the patient was instructed to cough. The right lower lobe branches were filled with pus. This was removed by suction and each branch examined in turn and the patient instructed to cough. By this means the branch from which the pus was coming could be definitely located, and the small but constant ejection of pus with each cough pointed towards the right anterior branch. This branch bronchus was sucked out, but pus would appear in the mouth of the bronchus with each cough in spite of suction. The long slanting end of the bronchoscope was insinuated into this branch. It was now noted that there were many granulations in this branch which bled freely. About one ounce of bloody pus was aspirated at this time into a sterile bottle. This was examined by Dr. George S. Dixon, of the New York Eye and Ear Infirmary, who reported as follows: The pus removed bronchoscopically from the lung abscess of Mr. F. H. shows a pure culture of Friedlander bacilli. This was extremely interesting, for most of the infected ears which we see in the summer caused by swimming about New York harbor are usually due to the Friedlander bacillus, one of the colon group. This man had a lung abscess caused by the inspiration of sea water about New York harbor.

For definite lung mapping the abscess cavity was injected the following week with a mixture of bismuth subcarbonate in pure olive oil, one in three. The anterior branch of the right lower lobe bronchus was injected around a corner by a special curved spiral cannula. The bismuth mixture was injected slowly so as not to infiltrate the surrounding lung tissue. Eight c.c. of the mixture was injected, and within five minutes from this time the

*Read at the annual meeting of the American Laryngological Association, held in Boston, Mass., May 27 to 29, 1920.

patient was fluoroscoped by Dr. Charles Gottlieb and some very interesting observations were made. By fluoroscopy we were able to see the cavity filled with the opaque mixture. Plates taken before injection of bismuth did not show any definite outline of the abscess. Several plates were taken in all



FIG. 1.—Radiograph of abscess in right lower lobe of the lung. Note the dense shadow produced by "pus sponge soaking" of the lung. The outline of the abscess cavity is not clearly discernible.

positions and a set of stereoscopic plates made. Within a short time after the taking of these plates the patient was again fluoroscoped and the bismuth mixture was seen to be coming out of the abscess cavity and flowing upward. He had not coughed up to this time for he was breathing as quietly as possible. He did have considerable cough, however, immediately following the removal of the bronchoscope, but the fluoroscopic studies made by Dr. Gottlieb, Dr. Corwin and myself did not show any bismuth in the bronchi, but only in the abscess cavity. It was extremely interesting to note that, while the bismuth was coming out of the abscess cavity into the bronchi, it did not flow downward but flowed upward, and radiographic plates taken at this time showed the middle lobe and superior lobe branches well outlined by the opaque mixture, while the lower lobe branches remained free. Shortly after this the patient complained of such bubbling in his chest that he was compelled to cough and expelled about two c.c. of the white bismuth mixture. From these observations Dr. Gottlieb and myself agree that there is probably another mechanism beside cough and the action of cilia which causes the expulsion of secretions from the tracheobronchial tree. A second injection of the bismuth mixture was repeated one month later.

The injection of bismuth mixtures while done for the purpose of mapping the lung for the definite location of abscess cavities seemed to have a beneficial effect on the patient. There was no odor to the pus expectorated after the second injection and this was so striking that the patient noticed it himself and said "that he no longer had a foul breath for the bad smell and taste had disappeared."

The patient was examined radiographically and fluoroscopically one month later to ascertain how

long the bismuth remained in the abscess cavities and also how long it remained in a small area of lobular tissue into which it had infiltrated. The bismuth mixture, as previously stated, started to make its exit from the bronchial tree within a short time after injection. It is interesting, however, to note that in the abscess cavities and lobular structure it remains much longer but eventually disappears. In the abscess cavities it may remain from two weeks to two months, but the shadow gradually grows less opaque until it finally disappears. This may perhaps in a measure account for the improvement of the patient and the gradual diminution in the quantity of pus expectorated and the disappearance of odor.

CASE II.—The second patient injected was a young lady of twenty years whom I had the good fortune to see in consultation with Dr. Willy Meyer and Dr. Richard Jordan. The patient was admitted to the Lenox Hill Hospital and bronchoscoped shortly thereafter. Some very excellent radiographs were taken by Dr. William H. Stewart which showed what appeared to be a very large abscess in the left upper lobe well out towards the periphery. From the surrounding pus sponge soaked lung structure it appeared much larger than it really was and also suggested some pleural involvement. The patient had had a tonsillectomy performed by an expert laryngologist one week before admission. At the time of admission she was expectorating 250 c.c. of pus every twenty-four hours, and her general condition was poor.

She was bronchoscoped, a seven mm. tube being used. Pus was pouring out of the larynx and continued to pour out of the bronchoscopic tube. This was sucked out and the left bronchus entered.



FIG. 2.—The abscess cavity mapped out by the injection of an opaque mixture. The walls of the abscess cavity are clearly defined. The dull opaque spot above and to the right of the abscess cavity is due to the infiltration of bismuth in a minute branch bronchus well out toward the periphery which connected with the abscess cavity. The abscess communicated with an anterior branch bronchus and was injected around a corner.

There was an edematous bronchial stenosis opposite the upper lobe orifice leaving only a small opening through which pus was expelled with each cough. There was also a membranous plaque which caused further obstruction of drainage. The membranous

plaque was removed by suction. After evacuating as well as possible the upper lobe branch the lower lobe branches were examined, but no pus was found in this locality. Now the upper lobe branch was again entered and the patient instructed to cough. With each expulsive cough there would be a gush



FIG. 3.—A left upper lobe abscess following tonsillectomy. Note the dense shadow well out toward the periphery simulating pleural involvement. Dense "pus sponge soaking" of the lung made the interpretation of the abscess cavity difficult in the plates before injection.

of pus from this branch. The bronchus was apparently draining much more freely since the edematous stenosis had been opened. With a ten inch vacuum the bronchus was once more aspirated and after fifteen minutes the bronchoscopic tube was removed.

The following week the patient had improved somewhat, but the amount of pus had not greatly decreased. We again bronchoscopically aspirated the left upper lobe branch, and then decided to inject the bismuth and oil mixture to try and map out the abscess cavity. With a curved spiral cannula, eight c.c. of the mixture was injected.

Unfortunately the mixture was injected too forcibly and some of it was squirted out of the spiral and passed downward into the lower lobe branches. Leakage out of the spiral will not occur if the mixture is injected slowly, nor will it infiltrate into the lobular structure of the lung. The upper lobe branches and lung abscess were also injected; the bismuth sticking to the wall of the cavities and mapping them out. Several smaller abscesses were seen, whereas in the plate taken before injection the cavity was interpreted as being very large. The

bismuth did not infiltrate the lobular structure of the upper lobe.

By stereoscopic plates the abscess cavities were seen to be well out towards the periphery and anterior, while the mass which had leaked down into the lower lobe branches was well posterior. A lateral plate taken at this time showed the relations of the upper anterior lobe abscess cavity which was clearly defined, to the posterior dull opaque fan shaped area due to gravitation into the dorsal branch.

The bismuth was expelled from the lung as in the other patient within twenty minutes after injection. As some of the bismuth mixture had leaked downward into the lower lobe branches it was impossible to state whether or not the bismuth started immediately to be expelled outward as in the first patient or if it had gravitated into the lower lobe branches after it started to be expelled. The patient was studied from time to time with the fluoroscopic screen, and further radiographic plates were taken. At the end of one week there was still bismuth present in both the abscess cavity and in the lower lobe where no abscess existed. This bismuth soaked

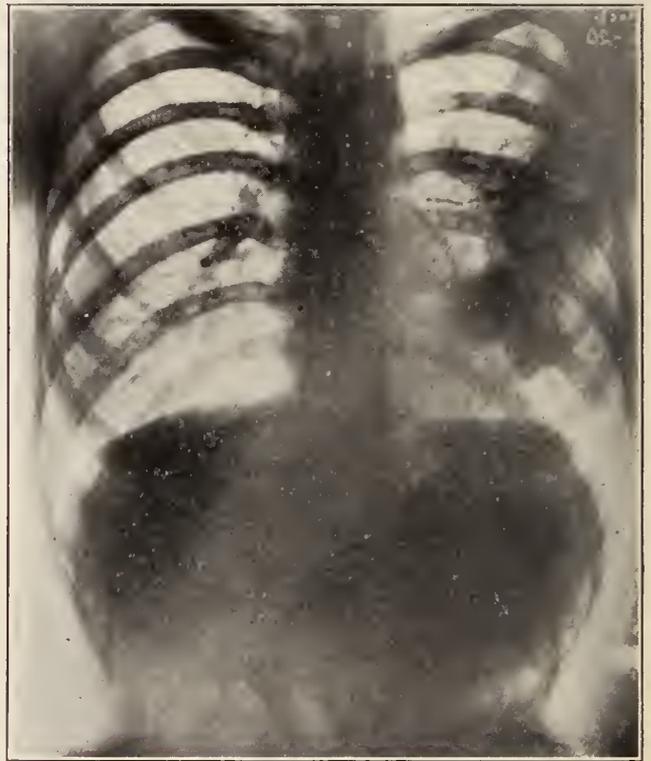


FIG. 4.—The abscess cavities injected around a corner. The lower branches of the upper lobe were injected by turning the curved spiral injector downward after introduction into the upper lobe branch. Some of the bismuth mixture leaked out of the curved spiral and gravitated into the lower lobe branches where no abscess existed. Numerous small cavities were mapped out in the original plates and there was a bright metallic lustre of the mixture in the abscess cavities. In the lower lobe where no abscess existed the bismuth mixture showed as a dull opaque spot.

area looked somewhat like an abscess cavity, but there was an irregular outline of opaque dullness and it had not the metallic lustre of the bismuth in the abscess cavity. This is one of the distinguishing points recorded by me between the infiltration of bismuth into the lobular structure of the lung and

in the abscess cavity. This patient improved after the injection in a similar manner to the other patient. The pus decreased from her lung and the amount of measured sputum decreased from 250 c.c. to 30 c.c. every twenty-four hours. The odor was decidedly less and the patient's general health improved.

The bismuth mixture was still present in the lung when plates were made ten days later, though both shadows were decreasing in density and the lung abscess was apparently clearing up. The patient has suffered no discomfort following the injections of bismuth into her lung. She eats and sleeps well and has but little cough. She has been bronchoscoped twice since the two injections and no bismuth were we able to recover by suction even though it is still present by x ray examination. At later bronchoscopic examinations there was very little pus recovered by suction, for no pus was expelled from the left upper lobe bronchus when the patient was instructed to cough.

Of course this paper is not presented with any tone of finality for it is only a short preliminary report of the study by injection of opaque mixtures for the purpose of mapping abscess cavities in the lung of the living subject.

SUMMARY.

1. Bismuth mixtures can be injected into the bronchi and lung of the living without doing harm.

2. The injection of opaque substances into the lung of the living will open up an enormous field of usefulness in the study of cough, the expulsion of secretions from the lung and lung drainage. It will also localize bronchial strictures in the same manner as seen in the esophagus. Furthermore, it will be of the greatest aid to the thoracic surgeon by mapping out the abscess cavity in the correct lobe of the lung on which he is to operate.

3. A definite lung abscess cavity is seldom seen bronchoscopically. Pus is usually seen coming from a small branch bronchus, and the abscess cavity may be well around a corner and not in a direct line with the bronchus from which the pus is oozing.

An injection of a bismuth mixture or some other opaque substance will clear up this error.

4. Bismuth when it enters the abscess cavity is interpreted in the radiographic plate

by its metallic lustre, and when it is in the lobular lung structure it is interpreted by its dull opacity. Pus diffuses and soaks the lung structure, and this often makes the involved area appear many times larger than it really is.

5. The amount of bismuth injected in these patients was an eight cubic centimetre mixture of bismuth subcarbonate in pure olive oil, one in two and one in three. The mixture is made sterile by boiling before injection.

6. The injection should be made slowly and not with a squirt, for the picture may be spoiled by bismuth lung soaking.

7. From these preliminary studies it seems that cough and the action of cilia may not be the only means of expelling secretion from the lung.

8. While bismuth mixtures were originally injected by me for purposes of lung mapping of abscess cavities in their proper lobes, it seems to have been of apparent benefit to the two patients in whom it was tried. So far it has done no harm.

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127 WEST FIFTY-EIGHTH STREET.

Proofs of the Constitutional Nature of Cancer*

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Cancer has too long been studied and regarded as a purely local disease. On the other hand, evidence has been steadily accumulating all over the world that, while the individual lesions of carcinoma may be incited by local injury, the disease is really of a constitutional nature, like so many other diseases, especially in middle and advanced life. No one would think of regarding arteriosclerosis, arthritis deformans, gout, obesity, or dia-

betes as local affairs, amenable to purely local treatment, nor of expecting to accomplish anything of importance by excising the late lesions of syphilis or tuberculosis. As yet the medical profession and laity are slow in accepting the now well recognized constitutional relations and nature of cancer.

Not to go back too far, over a hundred years ago the great English surgeon, Abernethy (1), very earnestly said: "There can be no subject which I think more likely to interest the mind of the surgeon than that of an endeavor to amend and alter the

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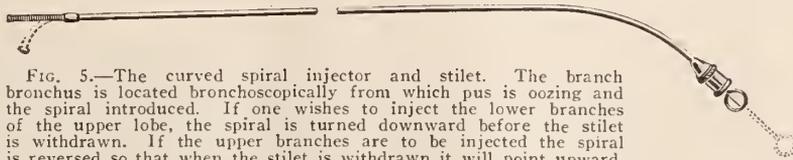


FIG. 5.—The curved spiral injector and stilet. The branch bronchus is located bronchoscopically from which pus is oozing and the spiral introduced. If one wishes to inject the lower branches of the upper lobe, the spiral is turned downward before the stilet is withdrawn. If the upper branches are to be injected the spiral is reversed so that when the stilet is withdrawn it will point upward. Leakage of the curved spiral may be obviated by applying a coating of flexible collodion to it. The collodion should be thoroughly dry before introduction of the spiral. This will prevent leakage and thereby overcome misinterpretation of the radiographic picture.

state of a cancerous constitution. The best timed and best conducted operation brings with it nothing but disgrace if the diseased propensities of the constitution are active and powerful. It is after an operation that, in my opinion, we are more particularly inclined to regulate the constitution, lest the disease should be revived or renewed by the disturbance."

Over seventy-five years ago Walshe (2), in his masterly treatise on cancer in all its relations, gave numerous references, original or quoted from recognized authorities, in regard to the constitutional nature of cancer, as well as expressions in regard to the futility of expecting that surgical interference could cure the disease in any great proportion of cases. He says: "It would in theory appear that the removal of a tumor cannot of itself cure the disease, as the local formation is but a symptom of a general vice of the economy. . . . This tissue being, as the normal textures, the seat of nutrition, is, like them, susceptible of its disordered actions." Sir Astley Cooper (3), a great surgeon, had some time before expressed the same views.

Over fifty years ago, Sir James Paget (4), that prince of pathologists and surgeons, spoke very strongly in regard to cancer: "I believe it to be constitutional, in the sense of having its origin and chief support in the blood, by which the constitution of the whole body is maintained. . . . The existence of the morbid material in the blood, whether in the rudimental or in the effective state, constitutes the general predisposition to cancer."

Nearly forty years ago, Dr. Willard Parker (5), one of New York's greatest surgeons and a wise physician, in a study of 397 cases of cancer of the breast, spoke very strongly on the subject. He says: "Cancer is to a great degree one of the final results of a long continued course of error in diet, and a strict dietetic regimen is, therefore, a chief factor in the treatment, preventive and curative." After speaking of the surgical removal of a cancerous breast, he says: "We must then adopt the means stated above to prevent a second development. We must change the diathesis; we must seek to modify the patient's constitution, so that it will no longer be prone to reproduce the disease; and then only may the surgeon be satisfied that he has done his duty."

During all this period, and since, very many others have promulgated the same views, with more or less earnestness and persistency. One of these is Sir Arbuthnot Lane, who a few years ago emphasized the fact that one of the terminal results of intestinal stasis may be cancer.

Dr. Forbes Ross (6), also of England, wrote very strongly of the constitutional nature of cancer, giving illustrative cases, and his untimely end soon after the publication of his book robbed the cause of an intelligent and earnest worker in the field. Having been a very active operator on cancer, and seeing the unfortunate results of operation, he took up the study of the blood and cancer, adducing very strong arguments and illustrations of the constitutional nature of the disease.

One of the most ardent supporters of this line of thought is Robert Bell (7), of London, whose intel-

ligent and clever books have never been taken seriously enough. Having also been a surgeon for cancer for fifteen years, and experiencing the ultimate bad results of the same, he abandoned surgery in 1894 and has written volubly on the dietetic and medicinal treatment of the disease, with illustrative cases.

The late Dr. John B. Murphy, of Chicago, has repeatedly expressed himself in his clinics (August, 1912, to June, 1914) most pessimistically in regard to the ultimate results of the surgical treatment of carcinoma, especially in those patients who are fat and have lax tissue, that is, exhibiting evidence of imperfect metabolism.

The latest, and under the circumstances the most important, supporter of a constitutional nature of cancer is Dr. William J. Mayo (8), who, in his president's address before the American Surgical Association, spoke in a manner which should attract serious attention. Few have had wider acquaintance with the surgical aspects of the disease than he, and few others know better than he how relatively impotent surgical procedures are to stay the steadily increasing mortality from cancer, which now claims about ninety per cent. of those whom it once attacks. Speaking of the prophylaxis of cancer, mainly from its surgical aspects, he says: "Cancer of the stomach forms nearly one third of all cancers of the human body. So far as I know this is not true of the lower animals, nor of uncivilized man. . . . Is it not possible, therefore, that there is something in the habits of civilized man, in the cooking or other preparation of his food, which acts to produce the precancerous condition? . . . Within the last hundred years four times as much meat has been taken as before that time. If flesh foods are not fully broken up, decomposition results and active poisons are thrown into an organ not intended for their reception, and which has not had time to adapt itself to the new function." In conclusion he says: "Where cancer in the human is frequent, a close study of the habits of civilized man, as contrasted with primitive races and lower animals, where similar lesions are conspicuously rare, may be of value, and, finally, the prophylaxis of cancer depends, first, on a change in those cancer producing habits, and, second, on the early removal of all precancerous lesions and sources of chronic irritation."

But all these warnings, and many more, seem to have been ignored and lost on the profession at large, and surgery is still regarded as the only hope for cancer, in spite of the demonstration that under its rule the mortality from cancer has risen steadily, since 1900 nearly thirty per cent., while that from tuberculosis has fallen about the same amount under proper medical care. Indeed, in 1915, the year after active surgical propaganda throughout the country, through the influence of the American Association for the Prevention of Cancer, the actual rise in the mortality from cancer, as shown by the United States Mortality Tables, was double the percentage of the average rise of the five preceding years. Moreover, in New York city, from July 1 to December 31, 1920, the number of recorded deaths from cancer, 2,691, exceeded those from

tuberculosis, 2,669, by twenty-two! The reasons for the lamentable condition in which carcinosis as a disease stands today, in regard to its treatment and ultimate results, are not difficult to discover, and may be briefly mentioned:

1. The glamor of surgery, and latterly of x rays and radium, and the craze for immediate and spectacular results.

2. The claims of the surgeons as to the success of operations, and the failure to record and report end results, after the lapse of years.

3. The results of laboratory and research work, wrongly supporting surgeons as to the local nature of carcinosis, and advocating the desirability of the immediate removal of the results or products of it, now called cancer.

4. Ignorance on the part of the general medical profession as to the true facts concerning cancer.

5. The many fake cancer cures which have been foisted on innocent sufferers, together with the many failures of remedies and measures which have been advocated by the regular medical profession.

I shall not discuss these points, which, I think, will be recognized and acknowledged by all, but will proceed to present, very briefly, facts which point unerringly to the proof of the constitutional nature of cancer. In order that these may appear clearly and appeal properly to the understanding of my readers, I have drawn them up in tabular form.

PROOFS OF THE CONSTITUTIONAL NATURE OF CANCER.

I. Laboratory findings	{ Negative { Cancer is not parasitic. Cancer is not contagious nor infectious. No cause for cancer has been found.
	{ Positive { Cancer cells are but altered normal cells. Feeding experiments show a possible control of cancer growth.
II. Statistical evidence	{ Contrast of death rate since 1900 between cancer and tuberculosis. Steady increase of cancer deaths under active surgery, x rays, and radium.
III. Biochemical evidence	{ Blood changes in early and late cancer. Metabolic changes in the system before and after the development of the local cancerous lesion.
IV. Clinical evidence	{ Opinion of many celebrated surgeons during the last hundred years to the present time. Spontaneous cures of cancer well authenticated. Dozens or hundreds of attested cases of benefit or cure of cancer by other than local measures, in this and other countries.

Most of the items on this chart are so thoroughly known and accepted, or are so selfevident that we need not waste time in considering them; but looked at in their entirety the total evidence of the constitutional nature of cancer is fairly convincing.

While cancer has been found to be neither parasitic nor infectious, and after years of laborious and honest laboratory research no cause of cancer has been found, does it not seem natural to question whether the research has been in the right direction, and if scientific investigation has been following the right clue? Has it not been following anatomical and experimental lines to the too great exclusion of physiological and clinical lines? For, as Pope says: "The proper study of mankind is man," and man is

a living being, and in a practical way physiology is more than histology in the actual life of man and his diseases. But, on the other hand, laboratory research has in a measure cleared the way along certain lines for the study of cancer which are bright with promise. All agree that cancer cells are only body cells, once healthy, which have thrown off their allegiance to normal control, leaving their natural function of secretion, etc., and expending their whole energy upon growth, which we call malignant because of the harm which we observe to result from their action.

Now, repeated laboratory experiences, by a number of reliable observers, have demonstrated in a most remarkable way the absolute controlling effect of diet on the development of inoculated cancer in mice and rats, so that the process was inhibited almost entirely by certain vegetable feedings. Does this not stimulate us to try to discover wherein this mysterious influence lies? Does it not suggest that possibly the outrageous conduct of the cells has something to do with the pabulum with which they had been nourished? Even as mutiny in a regiment or on shipboard might be started by one or more men who rebelled at the quality or quantity of the food furnished, and then be spread to many others, with new groups developing, until the errors were corrected.

The mortality of tuberculosis and cancer have often been compared and teach us a lesson along these lines, although in a different direction; the death rate of the former during the last twenty years has fallen, under wise medical direction, about thirty per cent., while that of cancer has risen almost the same thirty per cent., under active surgery, x rays and radium, because they were operating on the mistaken idea that cancer was a local affection. Both tuberculosis and cancer have to do with nutrition, but at opposite poles. The tuberculous subject is underfed and overworked, while the cancer patient is overfed or wrongly fed and underworked. In the former poor nutrition allows the operation of the omnipresent tubercle bacilli; in the latter certain individual cells rebel and mutiny. When the tuberculous patient is properly nourished, including oxygen, he ceases to furnish the necessary nidus for the bacilli, and when the cancer subject is nourished with a proper blood supply the rebellious cells return to their allegiance, as would the soldiers or sailors, if an intelligent officer rectified their errors of nutrition.

The biochemical conditions of the system, both in early and late cancer, attest the constitutional nature of the disease carcinosis, of which the masses we wrongly call cancer are but the product; just as the various lesions in tuberculosis, gout, syphilis, and leprosy, are not the disease itself, but are only its symptoms. All are familiar with the blood changes occurring in cancer; but unfortunately most of those known relate only to the corpuscular elements and not to its plasma, which has received the partially elaborated products of digestion, and the results of the metabolism of the system through the thoracic duct, and from which the corpuscular elements are formed and the individual cells of the body are nourished. Time does not permit of the

elaboration of all this matter, which has been abundantly treated of elsewhere. But to one who has watched and studied carcinosis in all its medical and surgical aspects for many years, it seems strange that there can be doubt in any one's mind regarding the constitutional nature of the disease, and the unreasonableness of attempting to check it permanently by simply attacking its local manifestations in various parts of the body. The spontaneous cures of well authenticated cases of cancer should teach us that, just as at some particular time a condition of system arose which led to the formation of a malignant neoplasm, possibly from a local injury, more often not, and then later something else occurred which led to the return to normal of the disordered cells, so medical acumen should seek to discover the latent reason of this, and medical skill should devise proper measures to correct it; and this has been done.

Finally, in regard to many matters in medicine we are all willing to regard intelligently and accept the judgment and views of those who have had wide experience along particular lines of thought and activity. But in regard to cancer, a mental obliquity, obtuseness, or something, seems to have taken possession of the entire medical profession, and also of the laity, to such a degree that they will not accept any cause of cancer unless it is absolutely proved by laboratory research. In regard to no other disease has there been such an imperative and insistent demand for a definite, established, proved and recognized cause as there has been in regard to cancer.

Now, no higher authorities could be quoted in favor of a constitutional nature of cancer than those

given at the opening of this address. The opinions from experience of many justly celebrated surgeons and physicians, from Abernethy, one hundred years ago, to J. B. Murphy and William J. Mayo of the present time, besides many others not mentioned, should quiet these unreasonable demands.

At the same time, the hundreds of cases of undoubted cancer which have been seen by many of us to yield to internal measures, even including various serums, should be enough to convince the most sceptical of the constitutional nature of cancer. This is especially true in view of the lamentable and terrible increase of mortality from the disease, under the local views held so strongly by many, since the days of Virchow, Cohnheim, and Ribbert, and the utter failure of local measures, such as surgery, x ray and radium, to check the advance of cancer racially all over the world.

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- 10 EAST SIXTY-FIRST STREET.

Neuralgias of the Superior and Inferior Maxillary Branches of the Fifth Nerve Caused by Dental Pulp Nodules*

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INTRODUCTION.

Neuralgia, defined in its primary sense, means pain, or a painful sensation of a definite type, limited to the sensory distribution of a peripheral nerve, or nerves. This pain may be referred to the surface distribution of the affected nerve, pressures on the areas of which causes a typical but not severe pain, which we are pleased to term neuralgic in character.

The neuralgias are differentiated from the neuritides, in that they are considered only as an affection of a peripheral sensory nerve, while neuritis is thought of as an affection of a mixed nerve—motor and sensory. This is a clinical differentiation.

The pathological differentiation is that in the neuralgias there seems to be no constant definite relation of pathological change to clinical symptoms, whereas, in the neuritides, tissue change is not infrequently demonstrated by microscopic methods, and there is a relationship of pathology to clinical symptoms.

In treating the neuralgias, our therapeutic resources are directed to a temporary or permanent relief of the chief symptom, pain.

Diagnostic technic should be exhausted in an attempt to ferret out the productive factor or factors of the pain, and to search for any associated pathological condition or conditions that may be the instigator of the local agent to dynamically react upon a peripheral sensory nerve.

*Read before the Schuyler County Medical Society, February 15, 1919.

Even though one be fortunate enough to locate the local cause of irritation and remove that cause, if associated or coexistent constitutional pathological processes are ignored, it is to be expected that, in the majority of instances, disappointment will occur to patient and physician. This is especially true of

gums), syphilis; the exogenous and endogenous intoxications; nonprogressive convalescent states following acute infections and surgical procedures with pyogenic complications; the metabolic diseases with their associated endocrine disturbances; tumors of the Gasserian ganglion, of the brain, of bone in the adjacent vicinity or inflammation of the bony structures within the neighborhood of the nerve. Indeed, it may at times be the initial symptom of tabes dorsalis, and Oppenheim cites a case of multiple sclerosis beginning as a facial neuralgia.

Neuralgias of the fifth nerve, having a psychological etiology, have been reported and are designated as psychalgias. They are amenable to suggestion therapy and psychoanalytical investigation. These cases should impress upon one the necessity of attempting to correctly evaluate the psychological content of a patient's mind, whether or not one suspects an hysterical or a neurasthenic makeup, for, indeed, it would be a serious reflection upon the intelligence of one who would extract teeth, devitalize teeth, or resort to surgical means, as alcoholic injections, avulsions, extirpation of the ganglia and section of the fifth nerve, in cases of psychological etiology.

In the following discussion the subject matter will be limited to the neuralgias of the superior and inferior maxillary divisions of the fifth nerve, caused by dental pulp nodules. For a number of years pulp nodules have been recognized as the excitant factor of some cases of neuralgia of the superior and inferior maxillary divisions of the fifth nerve.

It is the purpose of this article to emphasize the necessity of excluding the presence of pulp nodules in apparently normal teeth, in all cases of intractable neuralgia, before one hopelessly resigns oneself to a state of helplessness in treating these cases. Pulp nodules in apparently sound and healthy teeth, with little or no reaction to the ordinary tests, are difficult of diagnosis. Pulp nodules, present in decaying

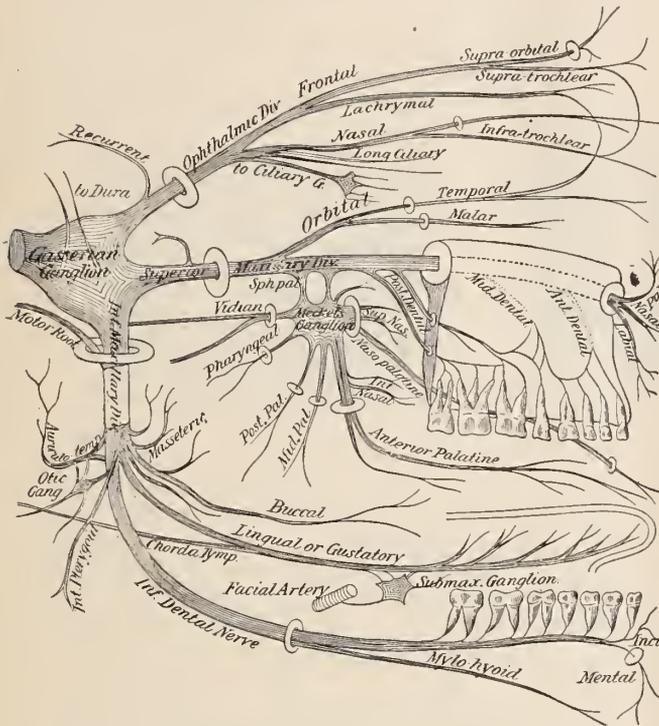


FIG. 1.—A schematic outline of the distribution of the fifth nerve, from Porter's *Quiz Compend of Anatomy*. P. Blakiston's Son & Co.

the quintus neuralgias, because of the widespread distribution of the fifth nerve and the intimate relationship that this nerve has to bone and bone cavities, as well as the number of constitutional diseases frequently found associated with these neuralgias.

The frequency of the occurrence of quintus neuralgias leads us to believe that it has a greater tendency to neuralgic involvement than any other nerve of the body. It is believed that the superior and inferior maxillary branches of this nerve, because of anatomical distribution, the intimate relation that they have with the teeth and the relatively exposed positions of their terminal filaments, are subject to a multiplicity of irritations that account for the predominating frequency of quintus neuralgias.

The causes of trigeminal neuralgia are many and are mentioned for purposes of review as follows: The teeth play a predominant rôle, perhaps undergoing a constructive or destructive pathological change, or, because of a constitutional defect in shape, position or development; affections of the gums, of the jaw bones, the cranial sinuses and the mastoid, frequently produce neuralgias of the fifth nerve and associated neuralgias that are difficult to differentiate from a regional point of view; diseases of the eye, as iritis, cyclitis, iridocyclitis; diseases of the ear; constitutional diseases, as arteriosclerosis, malaria, anemias, diabetes mellitus (this disease being particularly prone to attack the teeth and

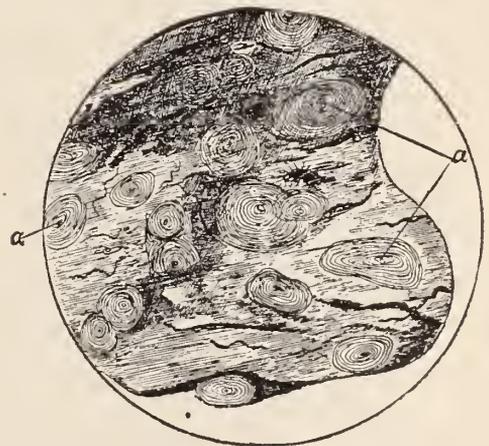


FIG. 2.—A section of the pulp nodule showing many calcospherites, as pointed out by a. a. (By permission of Professor Black, from Black's *Special Dental Pathology*.)

teeth, are comparatively easy to detect, and their removal is but part of the operation, extraction or devitalization deemed necessary by the operator for that particular tooth.

PULP NODULES.

Pulp nodules are small masses of calcic material suspended in the pulp substance which, by reason

of their progressive formation, effects a mechanical displacement to the point of strangulation, with resultant death of that tissue. They are commonly found in the bulb portion of the pulp, but may occur in the root portion, assuming a number of forms, those in the bulbar portion being round or nodular,

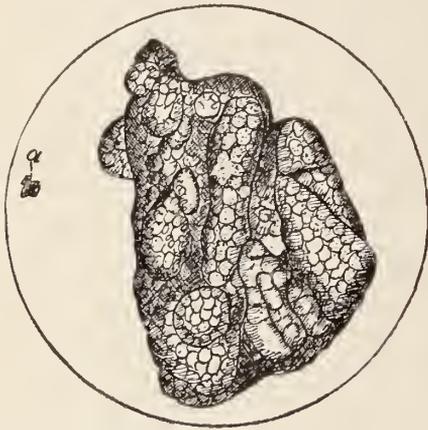


FIG. 3.—A small pulp nodule as seen with a low power, showing its nodulation; a, represents the actual size. (By permission of Professor Black, from Black's *Special Dental Pathology*.)

while those in the root portion are fusiform or spindle shaped. They are more frequently multiple than single, and it is believed that the larger nodules are formed by the coalescence of the smaller ones.

Histologically, they consist of an amorphous, translucent substance of a brittle consistency. Occasionally, concentrically laminated bodies, called calcospherites, are found irregularly interspersed throughout the nodule. Why pulp nodules form is still a matter of speculative conjecture. Black reasons that pulp nodules are the homologues of phleboliths, and believes that the calcifications are formed from a solution of albumin, calcium salts, and an excess of carbon dioxide, the result of venous stagnation. The authors believe that pulp nodules are not necessarily the result of a local circulatory or metabolic disturbance, but a localized manifestation, in some cases, of a constitutional metabolic disturbance or dysfunction, much after the same manner as the calcifications in arteriosclerosis.

In many instances it appears that abrasions, erosions and slowly progressing caries are responsible for their formation; however, this is by no means the rule, for they occur in teeth free from irritation or pathological attack. These nodules are usually found in the teeth of persons in or past middle life, but occasionally occur in youth.

SYMPTOMATOLOGY OF PULP NODULES.

There appears to be no relationship between the frequency of occurrence of pulp nodules and the production of symptoms. They do not produce symptoms with any degree of consistency. They may be present and apparently do no harm, and, conversely, their presence may initiate an irritation of the terminal dental nerve filament because of mechanical pressure.

It is a reasonable assumption that these nodules should produce symptoms in every case, but the converse is true in the majority of instances, para-

doxical as it seems. This discrepancy between cause and effect may be accounted for by their slow formation, permitting the dental pulp to accommodate itself to the change within its tissue, without giving rise to symptoms.

However, it appears that when the nodule or nodules become large enough to strangulate or obliterate the pulp tissue, symptoms are produced. The symptoms are the result of mechanical irritation, by the nodule or nodules, to the terminal nerve filament within the pulp tissue. Usually the local symptoms are hyperesthesias, not limited to the particular tooth or teeth affected, but affecting the pulps of all the teeth on that side of the dentures. Black has noted that general pulp hyperesthesia may be the precursor of an acute gouty or neuralgic attack.

Unless the nodule or nodules are located and removed, continuous pain stimuli are transmitted by that branch of the fifth nerve supplying the affected tooth or teeth. It is known that if a sensory nerve transmits continuous pain stimuli, fatigue will result. Fatigue is the end result of biological changes, in nerve tissue, necessary for the performance of specific function. If fatigue is prolonged by reason of constant irritation (pain) to a terminal dental nerve filament, neuralgia of the main nerve trunk results, with reflex neuralgic manifestations in its branches. This explains why the neuralgia does not disappear until some time after the local agent is removed. Time is necessary for a complete recuperation of the nerve itself.

DIAGNOSIS.

After excluding all probable etiological factors, excepting calcifications occurring within the pulp chambers of teeth, it is believed that a thorough search should be made for pulp nodules. The only definite means of determining whether or not they exist is by radiographs. In many instances, because of some fault in the technic, these nodules are not revealed on the film, emphasizing the necessity of making repeated exposures before one excludes their presence. Unless all the teeth, upper and lower, of the affected side be radiographed, the search for nodules will not have been thorough.

Percussion, thermal and electrical reactions and transillumination are of no definite value in the diagnosis of these nodules. One may be led to suspect calcific formations in the pulp tissue of

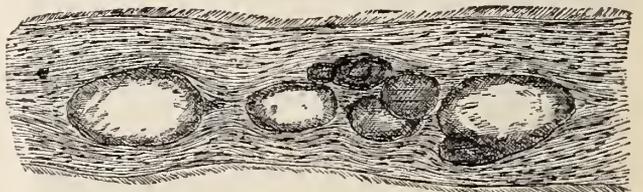


FIG. 4.—Pulp nodules in the canal portion of the pulp. (By permission of Professor Black, from Black's *Special Dental Pathology*.)

teeth that are abraded, eroded, or in teeth containing large metallic restorations; however, this is by no means axiomatic. To repeat, the diagnosis of pulp nodules is possible only by means of careful radiographic procedures, and the search should include all the teeth, upper and lower, on the affected side.

TREATMENT.

Much unnecessary disfigurement has been done by the promiscuous extraction of teeth in an attempt to relieve a neuralgia in which a positive diagnosis of the existence of a pulp nodule had not been made.

In many instances the local symptoms are referable to an unaffected tooth, and this again emphasizes the necessity of the radiographic localization of pulp nodules.

Having determined the affected tooth or teeth, devitalization of the pulps of the affected teeth is

of the trouble. It seemed that the hyperesthesia was centred about this tooth. Despite the clinical subjective evidence, radiographs facilitated the localization of the pulp nodule, the extraction of the right tooth, and gave her the much desired relief. Otherwise, the wrong tooth would have been pulled, with resultant disfigurement, the loss of a useful tooth, and no relief from the pain. Unfortunately, this case was not studied clinically, and there is no data concerning her past history or of her present physical status. This case was



FIG. 5.—Radiograph showing pulp nodules in upper second molar.



FIG. 6.—Radiograph showing pulp nodule in upper third molar.



FIG. 7.—Radiograph showing a calcification occurring in the mesial horns of the pulp of the lower first molar.

the only treatment after orthodox treatment of the local and constitutional manifestations have failed.

One should be conservative in the ruthless destruction of pulps in apparently sound teeth, even though pulp nodules have been radiographically demonstrated, without first attempting to correct constitutional disturbances, excepting in the cases in which a large nodule almost or completely fills the pulp chamber. However, if the usual therapeutic measures fail to give relief, one should not hesitate to sacrifice the pulp of an affected tooth, for the value of the pulp of a tooth is insignificant when compared to the relief of an intractable neuralgia.

The favored method of devitalization is either by pressure anesthesia, using cocaine or phenol, or by conductive anesthesia.

CASE REPORTS.

CASE I.—Miss X., a girl of twenty years, came for treatment because of a severe trifacial neuralgia of the left side of her face. She believed that the pain was of dental origin, and insisted that the upper left first molar be extracted. Her reason for this belief was that this tooth had been devitalized, and previous to its devitalization had caused her much pain. Radiographs revealed the presence of a pulp nodule in the upper left wisdom tooth (Fig. 2). This tooth was extracted. Upon dissection of the extracted tooth, the diagnosis was proved to be correct, as a pulp nodule almost completely filled the coronal portion of the pulp chamber, and, through mechanical pressure, initiated the irritation of the terminal dental nerve filament in the dental pulp, and in this way produced a severe superior maxillary neuralgia. This tooth was extracted because of its inaccessibility for properly filling the root canals (the roots being tortuous) and because of its comparative uselessness. This case teaches one the necessity for the absolute localization of the affected tooth, as the patient was convinced that the upper first molar was the seat

observed from the clinic of the Dental Infirmary of the University of California in the fall of 1917.

Upon Dr. Johnston's return to the infirmary, after his discharge from the service, he found that this girl had returned to the clinic, complaining of an acute toothache. She told the dentist of her former trouble, and he x rayed her teeth and found that the lower first molar was badly abscessed. The tooth looked normal; that is, there was no evidence of exposure of the pulp or any large fillings which would have caused a devitalization of the pulp with the resultant abscess. Pus was discharging at the free border of the gum around the neck of the tooth, having burrowed its way along the roots of the tooth. The radiographs revealed a large pulp stone in the first left lower molar and a smaller one in the second left lower molar. This pulp stone in the first molar had enlarged to the extent of strangulating the pulp, causing its death and the resultant abscess. The tooth was extracted after the acute stage had subsided, and dissection again proved the correctness of the radiographic diagnosis. This emphasizes the necessity of x raying all of the teeth, for if calcification is shown to exist in one tooth, there is a reasonable assumption that there is a tendency for similar changes in other teeth. Had this fact been known when pulp nodules were first demonstrated in the upper left wisdom, and had the other teeth been radiographed, this large nodule in the first left lower molar would have been found, and, fearing that it might cause either a neuralgia or a devitalization of the pulp, it would have been justifiable to remove the pulp and the nodule. This would have saved her the loss of the tooth and prevented the suffering from an abscessed tooth. From the looks of the nodule in the second molar it appears that this tooth is doomed in short time to come. The thing to do is to devitalize the pulp, remove the contents of the pulp chamber, and fill it while it is in an aseptic condition.

CASE II.—Mrs. Y., aged thirty-four; referred for treatment of an intractable trifacial neuralgia of several months' duration. Patient developed normally, had the usual diseases of childhood, and at the age of eighteen had typhoid fever. Had otherwise been very well up to the past two years, when she began putting on weight, gaining in two years' time thirty pounds. Her menses became irregular and scanty at this time. She was excessively fond of sweets, and complained of always being thirsty. Her family history was negative. Physical examination revealed a decayed wisdom tooth, slightly enlarged and congested tonsils, a negative chest, a large, pendulous abdomen and a flabby skeletal musculature. Urine showed a three and four tenths per cent. glycosuria, with no acetone or diacetic acid, the blood Wassermann was negative, the blood count showed a moderate anemia with a proportionate diminution of the red blood cell count. The decayed wisdom tooth was extracted and oral hygiene instituted. She was placed upon a diabetic regimen and upon small repeated doses of aspirin for the trifacial neuralgia. After two weeks of this treatment she became sugar free, had lost nine pounds in weight, and felt physically improved, but the neuralgia persisted. It was decided to x ray her teeth, and in the lower left first molar was found a pulp nodule (Fig. 3). The tooth was devitalized and the nodule removed. She did not recover immediately, but the pain gradually subsided until at the end of three weeks she was practically free of it.

At the end of two months the pain had entirely disappeared and the patient was discharged as cured. Apparently a constitutionally metabolic disorder had occurred some two years previous, which had not been attended to, and the nodule was most likely a localized expression of the general metabolic disharmony. There does not appear to be other nodules in her teeth, and the likelihood is that if she remains under intelligent supervision they will not develop.

So far as we know, two such cases have never been published before. While they perhaps have occurred in the practice of a great many men, at the same time it is not believed that such has been reported. The authors would be glad, indeed, to receive the cooperation of dentists and neurologists throughout the country in reference to the production of trifacial neuralgia by pulp nodules. Additional case reports may serve to teach us some facts that may be pertinent in excluding pulp nodules as a cause of trifacial neuralgia. While we recognize that a great many men have been able to demonstrate that a nodule has been the excitant factor of a trifacial neuralgia, yet the point we wish to make is that the pulp nodule can be and should be radiographically demonstrated, not only in decayed teeth but in teeth that are apparently healthy and sound.

265 WEST SEVENTY-SECOND STREET.
2446 CHANNING WAY.

The Influence of the Prostate on the Health of the Man Past Middle Life*

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The health of the individual may be summed up as the result of proper intake, assimilation, and elimination. The last is the most vital, failure of elimination causing a storing up in the system of toxic products, with damaging effects upon all the body tissues, resulting in impaired function of the vital organs. Elimination is carried on by the skin, intestinal tract and kidneys. The process, as incorporated in the action of the bowels and kidneys, must have a free channel for its excretion to the point of exit, i. e., anus and meatus. No matter how perfectly the kidneys functionate, urine excreted must have free passage through the ureters to the bladder, and from the bladder to the external meatus.

At the outlet of the bladder the prostate holds a crucial position. When we realize that between thirty and forty per cent. of all normal men show hypertrophy before the age of sixty and that relatively forty per cent. of these present symptoms, the importance of the proposition is at once apparent.

Fully twenty-five per cent. of patients presenting symptoms from prostatic obstruction come to us with carcinoma, thus adding to the severity of the problem. The changes which the prostate undergoes in men past middle life are degenerative, rather than hypertrophic, being glandular, resulting in enlargement of the organ; fibrous, causing shrinkage and hardening, or carcinomatous. Symptoms resulting from these changes are due to encroachment upon the lumen of the vesical neck from enlargement of the prostate, or contraction of the neck, with fixation, and narrowing of the lumen. While prostatitis and prostatic abscess are encountered at this age, they are rare in the absence of hypertrophy.

Realizing, then, that prostatic degeneration in the form of hypertrophy, fibrosis, or carcinoma takes place before the age of sixty in forty per cent. of all men, let us see what symptoms are first encountered, and what bodily changes take place as a result of this prostatic retrogression.

Since the prostate, by means of its lobes, surrounds the vesical neck, changes in its contour, size

*Presented before the Springfield, Mass., Academy of Medicine, October 12, 1920.

and consistency, easily interfere with bladder drainage by encroachment upon the lumen of the vesical outlet, or, by a hard ring, prevent the internal vesical sphincter from functioning properly. The first symptoms, therefore, will be those connected immediately with the primary function of the bladder, namely, the proper emptying of the reservoir.

Probably the first noticeable sign, which is often overlooked, is diminution in the size of the stream and a slightly increased voluntary effort on the part of the individual to expel the urine. This increased effort causes congestion of the vesical neck, which, in turn, gives rise to an increased desire to urinate. Disturbed function of the internal sphincter, allowing urine to leak into the prostatic urethra, causes more constant pressure on the external sphincter and further increases the desire to urinate. The patient begins to get up at night to void. There may be an interrupted stream. He notes that if he relaxes while the urine runs slowly, in time he completes the act. This is due to the ball valve action of the prostate which is often present early in the hypertrophy.

Change in the size and force of the stream, increased frequency, and intermittency, with dribbling at the end, are the first symptoms of prostatic change; and, while slight at first, in all probability will increase in severity with the progression of the pathological process. As the obstruction of the vesical neck becomes more complete, actual inability to empty the bladder takes place and residual urine collects in varying quantities. The bladder increases its effort to empty itself, resulting in hypertrophy of the muscle bands and giving way of the weaker places in its wall, with the formation of pockets. Frequency of urination now becomes directly proportionate to the amount of residual urine. The bladder fills more rapidly than usual, as it is never empty. This symptom is particularly distressing at night. I have known such a condition to progress until the patient, on first seeking advice, was incontinent at night from the fact that the bladder was always full and overflowed when the individual was asleep.

In time the bladder, from its increased activity, becomes dilated and weakened, and its efforts become feeble and more frequent. The process does not end here. The back pressure extends up the ureters to the kidneys, resulting in ureteral dilatation, pelvic dilation, and interference with kidney function. Congestion of the kidneys leads to polyuria, thus increasing the frequency. Interference with kidney function means poor body elimination which, in turn, affects all body tissues and all organic functions, with constitutional and local symptoms referable to each. The foregoing is the order of changes which take place. Some cases seen early in the retrograde prostatic change progress slowly under medical supervision.

So far we have considered the sequence of pathology and symptomatology, with the maintenance of an uninfected urinary tract. The kidneys eliminate toxic products, rendering the urine irritating, while bacteria in varying numbers are usually present in the urine. No harm results until the stasis takes place, with the presence of which inflam-

mation often supervenes spontaneously, or with the first internal manipulation of the physician, or soon thereafter. With the onset of infection all symptoms increase to a distressing degree, and the health of the individual suffers proportionately from added septic absorption.

We have, therefore, a lesion which is progressive, leading to far-reaching complications, and which, if left to itself, results in impaired comfort, efficiency and health, eventuating in invalidism in a considerable proportion of men past middle life. It is therefore a subject of great importance. How shall we cope with it? How can this prostatic degeneration be prevented?

ETIOLOGY.

The etiology of the condition is uncertain. Dependence upon infection is doubtful, as the process is one of advancing years and well past the usual period of venereal infection. The urine in early cases often reveals no evidence of infection caused by other pyogenic organisms. The prostates of practically all men past middle life are shown, on microscopical study, to be subject to the same adenomatous change which, in its more complete development, is called prostatic hypertrophy.

All factors that lead to congestion of the prostate, as inflammation, sexual excess or irregularity, sedentary life, and poor elimination undoubtedly predispose to the degenerative change; and it is fair to say that the prostate shares in the general well being of the individual who maintains a physical and mental equilibrium through proper intake, elimination, exercise, and sexual life, without undue mental stress.

The periodical physical examination of males past middle life may make it possible for us to detect the first signs of prostatic change in a large proportion of men; and by studying more cases in this stage, to arrest its progress, to alleviate the symptoms by minor procedures, to radically cure the condition by removal of the gland before secondary changes have caused permanent damage, and to detect carcinoma at a time when it can be handled to better advantage.

As a basis for what I shall have to say regarding the handling of cases presenting disturbances of urination sent to me as prostatic cases, I wish to briefly summarize 204 male patients of this type seen in private practice during the past year. Hospital cases have not been included in this group, as it is difficult in this class of patient to adopt the régime most satisfactory and to follow them carefully.

Of these cases fifty-two presented a clearcut adenomatous enlargement or so-called hypertrophy. Of these fifty-two, thirty-six were operated upon, the prostate being removed. Seven others are under observation, the condition not being extensive enough to make operation imperative at the present time, although it was advised in four of these seven. Seven others presented complications without severe symptoms, the symptoms being relieved by the elimination of the complications. Two, given suprapubic drainage, have not yet come to prostatectomy. Two of these patients were under fifty years of age; four between fifty and sixty; twenty-one between sixty and seventy; eighteen between seventy and eighty; two between eighty and ninety.

Four patients presented a small fibrous prostate. In one the prostate was removed, and in the others the hard ring was released by the removal of pieces with the intraurethral punch. The ages in this group were sixty-seven to seventy-four.

The largest group of cases comprised those presenting urinary symptoms in which a true hypertrophy could not be demonstrated, but in which a slight enlargement or hardening in whole or part of the prostate was present, often due to congestion, sometimes a beginning hypertrophy, in others a slight infection accompanied by a seminal vesiculitis. In none of these cases was the prostate removed. They form a type that requires observation—some a punch operation, others a destruction of tissue about the vesical neck by fulguration, others massage and the institution of measures tending to reduce congestion. Sexual excess, irregularities and continence played an important rôle in these cases.

Two of the patients of this group were under forty years of age, forty-five between forty and fifty, twelve between fifty and sixty, five between sixty and seventy, and one over seventy.

Carcinoma of the prostate was found in twenty-one cases, a strikingly large number even for private cases, patients who are expected to seek advice earlier than hospital cases.

Seventeen of these patients were treated by suprapubic drainage or radium or both. Their ages were: under sixty, two; sixty to seventy, six; seventy to eighty, eight; eighty to ninety, one.

There were five cases of bladder calculus, two of prostatic calculi, eight of stone in the ureter giving urinary symptoms only, two of renal calculi, four of pyelonephritis or pyonephrosis, nine of stricture of the urethra, ten of cancer of the bladder, thirteen of central nerve lesion with bladder symptoms, four of prostatic abscess, and eight of bladder papilloma.

This brief summary of cases presenting urinary symptoms characteristic of prostatic change shows that but fifty-two presented a true hypertrophy, four fibrosis, twenty-one carcinoma, and sixty-five were in a class that may advance to hypertrophy or carcinoma. The others were not true prostatic cases. This study of cases under close observation shows first of all the necessity of investigating the earliest urinary symptoms, the establishment of an accurate diagnosis by all our means at hand, and the institution of proper means of treatment.

TREATMENT.

When complete urological examination proves a case to be one of true prostatic hypertrophy, prostatectomy is the operation of choice, and can be carried out in nearly all instances.

The keynote of the situation is the relief of the most distressing symptoms as soon as is consistent with the circumstances. This means drainage of the bladder.

Bladder drainage relieves congestion of the prostate, back pressure upon the kidneys, toxemia resulting from interference with kidney function, and sepsis when infection has taken place. Such a sudden change is not always advisable or safe at once. The slow emptying of the bladder by catheterization, if this is possible, or even an indwelling catheter for

a period of time, may be wise. The patient suffering from prostatic obstruction and the back pressure resulting from it, has developed a certain balance which cannot safely be broken at once. A sudden relief of this pressure may result in suppression of urine from acute congestion of the kidneys.

I would like to cite the case of a man seventy-one years of age, first seen with a bladder which extended well above the umbilicus, and which, by estimate, probably contained sixty ounces of urine. A catheter was passed and retained in position. The bladder was not completely emptied for twelve days, at the end of which time it was emptied every few hours. Even then the patient became uremic, a condition which lasted a week before the symptoms—dry tongue, stupor, loss of appetite, abdominal distention, hiccough, and suppression—disappeared. He was then drained by a suprapubic tube. There was less reaction following this procedure, and after the prostatectomy, ten days later, there was no reaction, the patient was out of bed the following day, the wound was closed a week later, and he left the hospital two weeks after prostatectomy.

The first step in the relief of the prostatic obstruction is suprapubic drainage (under local or gas oxygen anesthesia). There is always a reaction following this step, from the cause mentioned above.

The difference between the reaction after suprapubic drainage and that after catheterization shows that the catheter drainage is not complete. Functional tests by the estimation of blood urea nitrogen content and phenolsulphonaphthalein output are extremely valuable during the period of drainage, to give us the accurate kidney balance. This period of drainage should continue until the patient has struck a new kidney balance at a certain level, which is maintained.

I would like to cite two recent cases. The first was a man seventy-three years of age, who came to me with sixty-two ounces of urine in the bladder, infection of the urinary tract, sepsis, high temperature (105° F.), kidneys that were palpable and tender, poor heart action—in fact, a picture of *extremis*. After catheter drainage for two weeks he was given a suprapubic drainage. This was followed by temporary suppression, but this in turn, by improvement in his general condition, which was continuous. The kidney tests at this time showed blood urea nitrogen sixty-four mils. to the c. c. and the phthalein output was too low to estimate. After three months of drainage, there was marked improvement in his general condition, the blood urea nitrogen reached a level of thirty mils., and the phthalein for two hours, fourteen per cent. He now went through the prostatectomy with no reaction, the wound was closed in ten days, and he is now in excellent condition, although the kidneys are largely destroyed.

Another patient, eighty-nine years of age, went through the same clinical course, his suprapubic drainage lasting three months, the prostatectomy at the end of this time resulting in no reaction, the wound closing in one week.

While these were extreme cases, many others in which I would have hesitated formerly to do a prostatectomy, went through with almost no reaction.

Only one patient, an operative case, of this group died, death occurring from pulmonary embolus twelve days after operation, with the wound healed.

The essential features of the operation are:

1. Suprapubic drainage of the bladder as soon as is justifiable.
2. Maintenance of suprapubic drainage until the patient has reached a new kidney balance, as evidenced by the patient's condition and by special tests. Such drainage relieves congestion of the bladder neck, with shrinkage of the prostate and lessened liability of hemorrhage at prostatectomy. It allows the wound to become a walled off sinus, lined with healthy granulations, and the bladder infection to clear.
3. Prostatectomy—performed through the dilated suprapubic sinus—by intraurethral enucleation, control of hemorrhage by a Pilcher bag.
4. Removal of the bag in twenty-four hours, allowing the suprapubic wound to heal by granulation,

which takes place rapidly owing to the healthy condition of the wound and aided by an indwelling catheter in the urethra.

Prostatectomy performed in this manner in cases of true hypertrophy, by its safety and excellent functional results, has changed the aspect of this dreaded condition, with its far-reaching complications. It is an operation to be considered before serious complications have become manifest and in cases that were formerly thought of as impossible surgical risks.

Too much emphasis cannot be laid upon the necessity of a careful study of cases presenting urinary symptoms, as evidenced by the fact that but fifty-two of 204 cases showed true hypertrophy, and of the proper observation of all cases, bearing in mind the large proportion of cases of carcinoma and our limited means of coping with malignancy in this location.

40 EAST FORTY-FIRST STREET.

Urologic Life Extension

By T. WARSAW WILLIAMS, M. D.,
Milwaukee, Wis.

The incorporation of a Life Extension Institute in New York city, under the auspices of such men as former President Taft, Colonel William C. Gorgas, Professor Irving Fisher, Elmer E. Rittenhouse, Dr. Eugene L. Fisk and many others, is significant of the progressive spirit of the times. Life extension depends largely upon the preservation of virility; I might say almost wholly. Our chief interest in it, as physicians, is the study of the resources offered by the medical sciences for deferring old age by deferring presenility. The physical and mental processes of life are largely dependent upon the reproductive functions and the ability to contribute to the continuance of human life on the globe. Their final extinction, from a physiological viewpoint, indicates the termination of the useful period of life, after which the individual cumbereth the earth, and, as suggested by Osler, might as well be chloroformed.

While the therapeutic plane has been elevated within the last ten years to an extent that renders the textbooks of our college days practically obsolete, no material improvement is noticeable in urologic teachings. This is due, as Dr. Vecki says, to the fact that the subject has never received the attention its preeminent importance deserves. Few medical men can boast ever having had an opportunity to hear a clinical lecture on sexual impotence, and the complaints and criticisms of authors all over show that this state of affairs exists in both Europe and America. Recent indications, however, as he admits, point to a better future, since such men of prominence and learning as Eulenburg, Krafft-Ebing, Furbringer, Martin, Lydston, Block, Sturgis and many others do not think it beneath their dignity to take up the perplexing problems of sexual life. It is a con-

summation to be devoutly hoped for that ere long the conventional medical lies that fill the pages of every book, brochure and article on the subject will disappear.

The light dawning upon urologic conservation is not apparent to the medical eye alone, but also to that of the public, which demands of science the prolongation of virility. What can we do for the sexually dead? If a man die, sexually, shall he live again? Yea, verily. The world is awakening to the possibilities of urologic life extension, i. e., to the retention of physiological potentia virilis as long as the other physical powers. The theory that the vita sexualis contributes immensely to the prolongation of life in general, and that the oncoming of age may be deferred so long as the reproductive functions remain active, is one pretty generally accepted by the foremost medical men of our time. Complete potency, as Dr. Iwan Block (1) says, has been observed in men of seventy and eighty years; and isolated cases have been recorded in which men of ninety and a hundred years have procreated children. The time will soon arrive when these will not be isolated cases. In the sense of Metchnikoff and Hirth, who proclaim the prevention of senility as a hygienic ideal, this physiological potentia senilis is no Utopia, and a future macrobiotic will defer the onset of old age by from ten to twenty years.

Potentia senilis, the retention of youthful vigor beyond the usual age at which most men lose all interest in love and marriage, is now rendered possible, not by any elixir of life or universal panacea, but by the scientific application of well known physiological principles developed from the researches of the older German physiologists—some of whom wrote over seventy-five years ago—includ-

ing Guenther, Hirtl, Eckhard, Lovén, Goltz and others.

The science of medicine should afford humanity that relief which it has failed to give throughout the centuries, and I am happy to say that we at least see a new light in that direction. To get down to the gist of the means at our disposal for restoring and preserving the virile powers, I might as well confess that it is useless to consult the oracles of the world's Delphic temples that have spoken since Hippocrates was born, some 460 B. C. They are not few nor silent, it is true, as an ample catalog of musty tomes attests; but they speak with an uncertain tone. As Dr. Vecki says: "Everywhere in the world it seems to be considered the proper thing to treat the affair with supercilious nonchalance."

If we inquire into the causes of premature decline of the reproductive functions, we are answered with words that mean nothing, "early abuse or later excesses or both"; "overwork," "structural changes," "organic complications," "the natural depreciation of age," etc., words that are only true in a general way, that we knew before, used to cover ignorance of fundamental principles of practice in this form of urologic ailments.

We might ask why these causes do not operate equally upon the other bodily functions—digestion, metabolism, assimilation and nutrition? Our present inquiry refers more particularly to functional sexual incompetence, in which the general physical condition in other respects is comparatively normal.

The ghost of sex weakness that has haunted the pillow of mankind so long has been laid at last. The greatest bugaboo of human ailments, one that has opened a regular Pandora box of suffering, misery and unhappiness, the mainspring of more misery and crime than all other physical ills combined, has at last been stripped of its terrors because science has penetrated its causes and points out a mode of relief.

In fact, there never was any real mystery about impotentia sexualis to excite our special wonder. On the contrary, there is no reason why the functions of sex should not depreciate with the advance of age or gradually fail in unison with other vital functions, or in advance of them. The eyes usually begin to get old at about forty, necessitating the use of glasses and the teeth often give out before that age. The hair also begins to get sprinkled with "silver threads among the gold," and in many the digestive functions become disordered at an even earlier age. The functions of the liver, bowels, kidneys, bladder, prostate gland, etc., from various causes are frequently disordered before fifty or sixty. Biliary insufficiency, intestinal indigestion and auto-intoxication are common ailments and have to be reckoned with before that age. Seventy-five or eighty per cent. of the death roll previous to eighty are preventable and curable conditions if looked after and treated on common sense principles.

It is well known that these conditions may be prevented, or removed, and life prolonged many years, by proper care and treatment. The greatest number of deaths from intercurrent affections that carry off hundreds, thousands and millions of human beings every year, are due to preventable

causes. Most deaths, indeed, that occur previous to eighty years, are premature. When we look over populous cemeteries, it is a saddening reflection that the majority of those silent sleepers might have lived ten, twenty, thirty, forty, fifty or more years longer had they, or their physicians, known what should be done to escape premature decay and death.

The sex functions provided by an Allwise Creator, for the continuance of life on the globe, are the very last of the vital functions to be developed. As a rule they do not begin to sprout, upon an average, until after all the other functions have been in operation for from twelve to fourteen years. Logically, therefore they should be the last instead of the first to fail, and in any case, should remain active at least as long as the other physical functions. Why don't they do it? The answer to this question is that all the other vital functions are more or less abused until their ability to functionate is impaired. This is the case with the eyes, teeth and digestive apparatus, as well as the sex functions.

It is a well known physiological law, that too frequent or too powerful excitation of a nerve, exhausts its power of reacting to that particular excitant for the time being. It must have time to rest and recuperate, after which it will again respond. If forced to respond too frequently, with insufficient rests between, its excitability is first reduced and finally exhausted. This is what is meant by sexual excesses,—too frequent excitation of the nerve-centres, and insufficient periods of inactivity between, until their power of reaction is suspended or annihilated. Evidently then, when an individual in the prime of life, normal in other respects, complains of impotentia sexualis, we are justified in informing him that he has simply exhausted his capacity for the time being; but that it is not dead; it may be revived by rest, moderate use, and special restoratives.

Abuse of any function does not mean misuse, or excessive use. On the contrary the nonuse of any function, organ or part, is more destructive than its excessive employment, hence undue continence is a moral as well as a physical evil. Man is supposed to use the faculties that mother Nature and father God gave him. Nothing was made in vain. Why should men and women have been given a purposeless, useless function or organ, and be told to go forth and increase and multiply?

Physiology emphasizes this fact in an unerring manner. If we do not employ an organ or function, Nature treats it as a useless appendage and proceeds to destroy it by starvation. "Why, indeed," she asks, "should I bring precious blood-bearing nutrition for growth, development and functional activity to an idle organ?" So she transfers it to muscles, bones, and tissues that work and must be sustained. Note what she did to that thymus gland when it stopped functioning. The organ that does not work, dies—literally starved. It does not get its quota of nutrition, has to live on itself, until it atrophies and fades away. Nutrition and work go together. If a muscle works, it demands nutrition—and gets it promptly. Nature never neglects her workers. The more work it does, the more nutrition it gets, and the more nutrition it receives,

the bigger and stronger it becomes. It is begging the question to say that the sex organs are anomalous in this respect—that they maintain their vitality just as perfectly as when working overtime. It is simply a physiological lie. Nature never made one law for a muscle and a different one for a gland. She never made a gland to remain fallow and still retain its functional power; if a muscle remains inert too long, it wastes to a mere thread. Ceaseless activity is the price of vitality. Hold your arm above your head, like the Eastern fakir, long enough, and nothing will be left but the skin and bone. Hold the head of the penis down long enough, and it shrinks away.

Those who preach and practise such logic, after they have wasted their manhood, come to me, sometimes, and ask for a remedy for the condition. But although the blood can work wonders in restoring and rebuilding injured and wasted tissue, there is nothing about dried skin and inanimate gristle to hang the flower of virility upon.

There is only one way under heaven whereby virility can be restored, and weak men made virile and that is flushing the anemic organs with an abundance of red blood. The question is, how can we do it? How can we create an increased circulation in the genitalia? I have no new, untried discovery to offer for the purpose, but have found the old ones effective if properly used.

Parts that have depreciated on account of loss of blood, starved as it were, can be restored by an increased blood supply. Physiologists understand this fact, and tell us that the nutrition, strength, development and functional activity of an organ or muscle depends upon the quantity of blood traversing it. If the amount is too small, the structure will be diminutive, and the part will atrophy. The athletes of ancient Greece and Rome secured superdevelopment of the muscles by a rigid system of exercise which brought a larger quantity of pabulum to the parts.

It would be illogical to assert that the rule did not apply to the organs of sex, as all experience proves the contrary. True, an athlete may be and often is, partially impotent. So are many priests who under their vows dispense with carnal pleasures. The priest becomes emasculated by the non-employment of the sex function. The athlete may be equally so, despite the fact that he is otherwise robust and powerful. But he understands that exercising the deltoid and feeding it several times the value of blood that uncultivated deltoids receive, will not develop or strengthen his sex organs any more than the muscles of the legs. For this reason, it is a fact well known to practical men that nearly all athletes are impotent.

In the treatment of sex weakness, we come in contact with the hoary error of the popular idea, shared to some extent by medical men, that a remedy for impotence is some sort of aphrodisiac that restores erectile powers as by magic, "while you wait." But if we are asked how, or upon what physiological principle such a restorer is supposed to act, we are compelled to answer that there really is no such thing as an aphrodisiac or special restorer of virility known to medical science, as the late Dr.

Hammond said, although there are agents, like yohimbin, cocaine, opium, cannabis indica, etc., that exert an indirect influence in giving temporary "pep" to the generative organs, either by suppressing the inhibitive centre, or stimulating the spermatic and ovarian plexuses, or perhaps both. But in such cases, stimuli of this nature, while producing a sporadic reaction, eventually render the impotence more profound, as the nerves soon cease to respond.

Not to waste time on the usual methods, the usual routine embracing local treatment, consisting of cauterization of the ejaculatory ducts, argyrol or other silver injections if prostatitis is present, Winternitz psychophores or cooling urethral and rectal sounds, injections of cold water into the urethra, sitz baths, river and lake bathing, matutinal applications of cold water, massage of the orchitic glands as recommended by Abrams, etc. These are all good things, in their way, and should not be neglected, in conjunction with the specific treatment. Their principle of action (not understood in many instances by those employing them) is the production of hyperemia sexualis, by reaction. But it is too slow and tedious to be depended upon, and does not produce sufficient reaction. The usual internal treatment is almost anything the physician's fancy may dictate—perhaps some of the much vaunted aphrodisiacs, yohimbin, or cocaine, the action of which is very similar, cannabis indica, opium, quinine, etc. All these drugs are given empirically, because they have been recommended as aphrodisiacs, without any clear understanding of their principle of action which is (or should be) stimulation of the genitospinal plexus. Favorable results may sometimes be obtained by these means, but as a rule they are uncertain, unsatisfactory, and disappointing. Very little permanent benefit can be expected from them, except to entertain and buoy up the patient for a while, and enable the doctor to enter something upon his ledger. But upon the whole, the final result in all cases, so far as my experience goes, is that little or no relief for marital incompetence can be expected from these measures. They do not produce active hyperemia sexualis, increased circulation, nutrition and functional activity of the organs, without which no actual improvement of the condition is possible.

If we specialize along this line, something more is expected of us than of the family physician, who only temporizes. In fact, the urgent necessity of getting results by the specialist renders a remedy that "cures quickly, safely and pleasantly" a *sine qua non*. In other words, we must bring about functional changes that will enable the impuissant patient to perform his rôle in the great drama of life in a manner creditable to the attributes of his sex.

All the processes of animated nature on the globe exist by the contraction and dilatation of the little bundles of nerves called plexuses. They are referred to in a general way as nerve centres, from which radiate the nerve branches and filaments innervating the various organs and tissues of the body.

According to a law of the economy, the stimulation of a certain plexus will produce contraction

of the ganglionic centre, and the muscular tissues and arteries which it supplies, reducing the quantity of blood reaching the organs or tissues supplied by the arteries; tickling another centre produces the reverse effect: relaxation, and an excess of blood supply of the parts supplied. Stimulation of the third, fourth and fifth cervical, for instance, produced by percussion, the rapid sinusoidal current, or hormones from the ductless glands, acts upon the phrenic nerve and contracts the lungs and bronchial tubes. A similar reflex action is produced by applying stimuli to the seventh cervical, causing contraction of the liver, spleen, heart, aorta, stomach, pancreas and arteries; it is resorted to for decreasing the blood supply of the lungs in congestion, as in pneumonia, for instance.

Percussion produces the vibrations upon which the therapeutic effects depend. The interrupted sinusoidal current is better than percussion, because the vibrations are shorter and more rapid. The electric current has nothing to do with it, as the vibrations produced by a vibrator, similar to that used by barbers, but smaller, produce the same effects. Rapid vibrations over the seventh cervical will relieve asthma and enable the patient to take a deep breath in one minute. A vibrator applied over the first, second and third cervical is one of our best remedies for the dizziness and vertigo of elderly people in whose brains sclerosis of the small arteries has already commenced. I have in several instances reduced that form of fibrosclerosis of the penis to which curvature upward or sidewise, is due, by vibratory massage. Should trials of this method establish its efficacy in this condition, so common in advanced life, its simplicity, and the fact that it involves no medication, will commend it equally to the public and the profession. Vibratory treatment is also valuable in deafness, lumbago, neuralgia and muscular rheumatism. Just how it does it, I do not pretend to know, but deaf people who work in factories, where there are vibratory noises, soon notice an improvement in their hearing.

Reflex dilatation of the abdominal arteries, stomach, spleen, liver, intestines, uterus, ovaries, etc., is caused by rapid vibrations over the tenth, eleventh and twelfth dorsal vertebræ. The prostate gland is contracted by vibrations, (percussion, electrical or vibration) over the twelfth dorsal—a valuable resource in prostatic affections.

The recognized fact that the quantity of blood traversing an organ can be increased or diminished at will, and its nutrition, development and functional activity modified, increased or diminished, by electrical and mechanical means, or by reacting upon its nerve centre, gives us a clue to the treatment for impaired sexuality. In this condition we usually find poor circulation in the organs supplied by the inguinal arteries. The organs themselves are often found to be in a relaxed, frigid, unexcitable condition, and in those who have not cultivated their sexuality, they are small and undeveloped. The condition in men, and women, too, for it is no respecter of sex, of sixty or sixty-five, is often associated with high blood pressure. The inguinal arteries consequently are more or less contracted, so that the blood supply of the organs is materially diminished.

When erection and libido occur, the blood pressure in the arteries generally, particularly in the inguinal, drops from fifteen to thirty degrees; they expand and convey an increased supply of blood to the erectile tissues, which become turgescient. If the general blood pressure is abnormally high, the arteries are contracted and do not expand sufficiently to supply the additional circulation required to produce the phenomena of erection. Remedies which lower the blood pressure are therefore necessary in the treatment of such cases, but should act directly upon the *centrum genitospinale*.

I have found that several of the hormones, especially those of the orchitic, prostatic and thyroid glands, stimulate the sex centre almost instantaneously, causing it to dilate, producing a similar effect upon the arteries of the genitalia, increasing the flow of blood into the sex organs. Their effects may be increased by combining them with pressure depressants, such as the nitrite group.

The use of these combinations internally, however, is not very satisfactory nor commendable on account of the action upon the heart and their systemic effects generally. After much experimentation I arrived at a less objectionable method of administration, viz., by securing their direct action upon the genitospinal centre through the medium of the *nervi erigentes* of Eckhard. I found that this could be readily accomplished by the injection of a well balanced combination of the hormones referred to into the anterior urethra of the male, or applying it externally to the *membrana preputialis* of the male, or to the glans clitoridis and the membranes of the labia of the female, where it almost instantly induces turgescence of the erectile tissues accompanied by libido. I found, by actual tests, that within a few minutes after applying these agents that the blood pressure in the inguinal arteries dropped from fifteen to twenty degrees, followed by more or less turgescence of the organs and a tendency to erection.

I first made these experiments upon the assumption that Goltz and Lovén were right in the belief, as stated by the former, that there was some sort of connection of the pudic nerves of the penis with the *nervi erigentes* similar to that of the vagus with the heart, or the chorda tympani with the vessels of the glandula submaxilaris; I demonstrated experimentally that Goltz and Lovén were right, and that impressions made upon the terminal filaments of the *nervus pudendus* (which supplies the prepuce and urethra in both sexes) react upon the genitospinal centre within a few minutes. All that is necessary to set in motion the train of phenomena which causes normal erection is to apply the proper medication to the inner lining of the prepuce or the urethra. The effect is not due to stimulation or varicosity of the membranes, as the agent used may be as bland as cream, but to a physiological impression reflexed to the centre.

These facts and experiments open the way to a better understanding of the basic principles of a new method of treatment to restore and preserve virility. Sexuality, like the muscles and all the other physical powers, can only be revived, strengthened and developed by cultivation. There is absolutely no other way. The disuse or misuse of any organ leads in-

evitably to its rapid deterioration. All the balsams of the Orient and the Occident can never recuperate, upbuild and strengthen them without the proper, moderate normal exercise of their functions, which increases the circulation in them. Enforced continence is an ascetic crime against nature; it is the mother of degeneration of the species. You might as well suspend an arm in a sling and expect it to remain strong or become muscular as to expect the sexual organs to retain virile vigor while their functions are suspended. It is a contradiction of terms.

The sacrohypogastric plexus (they are substantially one) presides over the genitourinary functions, and it is through those centres that we reach those organs by specific treatment. The object of the orthodox treatment of sexual impotence is to produce hyperemia sexualis, an increased blood supply. The easiest, I might say the only, effective way of doing this is by stimulating the genitospinal centre. Stimulation of that centre, by the God given stimulus of sex or by any approved internal or external agent, which increases the blood supply of the generative organs and induces hyperemia in them, is based upon a physiological anomaly met with only in the circulation of the erectile tissues which is not generally understood. Ordinarily, stimulation of a nerve causes it to shrink and contract, reducing the calibre of its arteries and the amount of blood it can carry. The reverse is true as far as the circulation of the erectile tissues is concerned. Stimulation of the genitospinal centre dilates instead of contracting the arteries and arterioles of the genitalia and causes a material drop in the blood pressure of the arteries supplying the generative organs, such as occurs in normal erection (Carpenter).

Erection of the intromittent organ as we know, is caused by an increased afflux of arterial blood and a retarded outflow of venous blood. Erection cannot, however, as Vecki (2) remarks, be brought about by mere compression or ligation of the veins. "That an increased flow of arterial blood takes place is proved by the lowering of the blood pressure in the neighboring inguinal arteries, and even as far as the arteria cruralis, as shown by the manometer. How this increased arterial afflux is caused is not yet explained." Hyperemia of the sexual organs is caused by excitation of the erection centre by either mental or physical causes.

The fact, as stated by Vecki, that mere compression or ligation of the veins will not produce erection, explains the fallacy of the various devices for procuring erection based upon this principle. There must be an increased afflux as well as a diminished efflux. We frequently meet with cases in which the afflux would be sufficient for erection if the blood could be retained in the erectile tissues instead of returning as fast as it enters. But, as a rule, there is more or less anemia of the generative organs from deficient circulation, and they are cold and clammy.

This condition is principally met with in elderly men and younger ones who have been too active in cultivating their sexuality. It is due, as a rule, to varicosity of the trabeculae of the corpora cavernosa. These cases call for a mixed treatment, something to excite the influx of blood into the organs and something to retard its outflow.

In these cases it is not sufficient to increase the circulation in the parts. In addition we must apply an obturator of some kind to compress the veins just sufficiently to prevent the too speedy return of the blood so as to retain the erection. These obturators can be made of different patterns. Some are merely wide rubber bands with an elastic retaining strap or cord that passes under the scrotum and prevents the appliance from slipping off, and is not in the way. These are better adapted for cases of partial impotency. In more pronounced cases, more satisfactory results are obtainable from an appliance of unvulcanized and vulcanized rubber worn under the everted prepuce, where it is invisible. Mechano-therapeutics is properly employed in these cases on the same principle as artificial teeth and limbs and eyeglasses.

In my private practice during the last twenty years I have adopted this treatment in several thousands of cases, and through its instrumentality have been able to extend the period of virility in many of them from ten to twenty years, most of which otherwise, must inevitably have been down and out years ago.

That life is prolonged by keeping the genitourinary organs in a normal condition is a selfevident proposition. Decadence of any one of the organs may be compared to removing one of a row of bricks which causes the rest to fall. Most men are really potent up to seventy or eighty; but owing to various causes, principally loss of erectile power, are unable to exercise the sex functions, and perforce are obliged to discontinue sexual relations with their wives. In most of these cases, libido and physical vigor are practically unimpaired, but loss of erectility prevents exercise of the sex function.

As age creeps upon man, like a thief in the night, it first impairs and finally destroys the ability of the obturator and constrictor muscles concerned in erection from performing their office or compressing the corpora cavernosa and deeper veins of the penis and thus preventing the return of the blood as fast as it enters the organs. The trabeculae of the corpora cavernosa also undergo structural changes, the ducts become flabby and patulous, rendering their closure more difficult.

The remedy in such cases is the use of something which accelerates the entrance of the blood, such as I have previously referred to as hormone compounds, and an artificial obturator which will slightly compress the corpora cavernosa and the dorsal vein sufficient to prevent the too precipitant outflow of the blood without disturbing the urethral canal.

The artificial obturators previously referred to in this paper should be adapted to each individual case, no one form being suited to all cases. When properly constructed, they have, in my experience, and in connection with appropriate medical treatment, extended virility in many cases for several years. Some patients for whom they were prescribed as far back as 1900, although now from eighty to eighty-five years of age, possess the ability to cohabit with their spouses. A gentleman residing in Kenosha, Wisconsin, who adopted this method of treatment ten years ago, recently married, at eighty-six.

Middleaged and elderly men who do not wish to relapse into innocuous desuetude, so to speak, should, in my opinion, keep alive the vital spark of virility as long as possible. In this connection a remark of George Hirth (3) is worthy of quotation.

"I do not ask," he says, "that the man in advanced age should play with his sexual powers; but that he should possess the consciousness of being able to use them—that I demand."

As previously remarked, sexuality is a cultivatable physical quality, and it should be cultivated. Cultivation not only promotes sexuality, but increases the development of the organs. As a rule, those who have abnormally small penes, have not much sexuality. This creates a vicious circle. Lack of sexuality disinclines them to cultivate it, and its noncultivation retards the development of the organs. When any glandular organ ceases to functionate, and no longer fulfills the purpose for which Nature intended it, she seeks to eliminate it by starving it out, by failing to supply it with blood. The sexual glands are no exception to this rule. When the sexual functions cease to be employed for the legitimate purpose for which they are intended, they invariably decay—or waste away. The remedy for this condition, often unintentionally permitted to develop, is to reverse the process and exercise their functions. The blood supply of a part is proportionate to the demands upon it. Nature is immediately aware of the demands being made upon the part and hastens to supply blood to reinforce and strengthen the parts to meet the demand. Thus, when increased demands for work are made upon the heart muscles, compensatory hypertrophy takes place. Upon the same principle, in proportion as an increased demand is made upon the sexual powers, Nature establishes compensatory development. The physician logically seeks to aid her by stimulation of the nerve centres controlling the nerve and blood supply of the parts. This practice has succeeded in men of over fifty or sixty, but succeeds better between the ages of thirty and forty, and still more so in the constructive period previous to thirty.

For the modern treatment of sexual debility in man, I have no universal panacea, nor even a new elixir vita to offer. As Dr. Sajous says, "the great need of the times is not so much new remedies as the judicious use of the old and tried ones with which we have been familiar for fifty years or more." Although we have no cureall, the treatment I have employed in my clinical practice in more than ten thousand cases, since 1890, has proved curative, or substantially beneficial in about eighty per cent. of the cases as they presented themselves. Of the remaining twenty per cent., some were incurable, from structural organic changes or other causes; others were of a psychic nature which no medicine could reach, but the large majority of failures were due to the habits and mental attitude of the patients themselves, inability or indisposition to carry out instructions. The treatment itself is easy and simple, but no matter what class of ailments are treated in dispensary and private practice, nor what manner of treatment is employed, there will always be a certain contingent that you cannot

materially help, owing to idiosyncrasies inherent in the patients treated, regardless of the merits or demerits of the kind of treatment employed.

The basic principle of the method of treatment I have found most satisfactory, that has given the best results in the usual forms of sexual debility—is the induction of active hyperemia sexualis by regular moderate stimulation of the genitospinal centre, flushing the organs with blood, increasing their circulation, innervation, nutrition and functional activity.

The experimental researches of some of the older German physiologists, especially Guenther, Hirtl, Lovén, Eckhard, Budge, Goltz and others, gave me the first inkling of this theory of treatment. Guenther's experiments on stallions, nearly eighty years ago, confirmed later by those of Eckhard, and others, proving excitation of the *nervus pudendus* of the prepuce, capable of causing erections, are particularly suggestive. Although neither Guenther himself, nor the physiologists of his day, seemed to be aware of the significance of his discovery, he builded wiser than he knew. It was in following out the logical inferences deducible from it that suggested to me the clinical experiments which finally led up to what may be truly called the modern treatment of sexual debility in man. It does not consist of any special specific aphrodisiac to be taken inwardly or injected, nothing that will, presto, change! clothe the aged and impotent with the *toga virilis*, like the baptism of fire administered by Mephistopheles to Faust, changing them instantly into vigorous, young men. True, it really is miraculous in the sense that it transforms, so to speak, premature senility into virile old age, "wintry, but kindly," setting back the dial as it were, from ten to twenty years; but it is one of those miracles of science which often happen these days, more logical, if not as so supernatural, as the miracles one reads about in ancient history. But it is a gradual change from impuissance to a normal condition of the reproductive functions, a steady, continuous recuperation and building up process due to improved circulation in the organs, effected by periodical stimulations and rests of the sex centre. It keeps men young, young looking, young feeling, young acting.

As previously remarked, the various substances capable of stimulating the genitospinal plexus, when taken internally—cocaine, yohimbin, cannabis indica and opium—although they produce an unwonted stimulation at first, the ganglion soon ceases to respond, and the last state of that patient is worse than the first. One reason is that it is necessary to take these stimulants in large doses in order to affect the centre; the mingling of the ordinary dose with the thirteen pounds or more of blood in the body being insufficient to affect the nerve centre materially; the latter becomes accustomed to the stimulus and ceases to respond. Poisonous doses speedily paralyze it and the patient is bereft of what little virility he had left.

There are, however, benign, harmless stimulants of the genitospinal centre which, when administered in minute doses to the genitospinal centre direct, act as a vital stimulus. The best of these are the nat-

ural hormones, or active principles secreted by some of the ductless glands—the orchitic, prostatic, ovarian and thyroid, lecithin from cord and brain substance. The action of some of the internal secretions, the suprarenal and pituitary, for instance, is quite different. What I have found most satisfactory for the purpose is an organic compound of the extractives first named, in a seven per cent. alcoholic normal solution, with the addition of antiseptics and a small flavoring of the nitrites in the form of a sterile, antiseptic, permanent emulsion, suitable for urethral injection.

This organic compound is administered *per urethram*, once a day as a rule; in anticipation of coitus, the patient may make an extra application. The average dose is a cubic centimetre or an ordinary medicine dropper or pipette half full. It is injected into the urethra with a bulb pointed pipette, retained for from one half to one minute, and the overflow is applied over the glans and everted prepuce. There is a slight twinge when it is first injected, but no irritation of the urethra, followed by slight frontal headache and flushing of the face for a few minutes. After the lapse of five minutes or less, the veins of the sexual organs begin to fill up, and the organ becomes more or less turgescient. This depends upon the degree of anemia and weakness present, being less marked in weakened conditions of the organs. Its aphrodisiac effects usually last one or two hours, gradually subsiding.

It is not necessary, as a rule, to use it oftener than once a day. It is a well known physiological law that, if a nerve is excited too frequently, it will cease to respond to that particular stimulus. Consequently, when applied too frequently, or in overdoses, it ceases to evoke the reflexes of the sex centre, thus rendering it impossible to abuse its use by keeping the organs in a continuous state of erethism. This quality thus adds to its medical excellence in premature emission in coitus, and spermatorrhea with involuntary seminal losses. In these cases it may be used twice a day. At first, of course, hypogastric stimulation aggravates the symptoms; but if it is continued for ten to fifteen days, the parts lose some of their irritability and the chronic erethism, due to hyperesthesia of the prostate and spinal centre, is gradually overcome.

The physiological explanation of how such a medicament applied to the urethra and prepuce stimulates the genitospinal centre, is as follows:

Guenther's experiments on animals in 1836-37, subsequently confirmed by Eckhard, proved that excitation of the prepuce gave rise to the phenomena of erection. Goltz's explanation was that connection of the *nervi erigentes* (which are mere filaments from the hypogastric plexus), with the *nervus pudendus* of the penis, is similar to that of the vagus with the heart and the chorda tympani with the vessels of the glandula submaxillaris. Whether this is true or not, it has been clinically demonstrated that some such nervous connection between the *nervus pudendus* and sacrohypogastric plexus exist, as shown by the fact that certain stimuli applied to those membranes produce the usual phenomena accompanying stimulation of the genitospinal plexus—dilatation of the arteries, lowering of

the blood pressure in the pelvic arteries and hyperemia sexualis, in less time than it has taken to describe it. This fact enables us to flush the genitalia with blood and produce hyperemia sexualis at will.

I should not omit to mention in this connection that the action of the emulsified preparation on the female organism is as prompt and efficient as upon the male. A valuable adjunct in retarded sexuality, chlorosis, anemia and amenorrhea, and in so-called idiopathic frigidity or original absence of the sex instinct, from anemia and atonic conditions of the spermatic and ovarian centres.

Flushing the genitalia daily with warm, red blood, producing periodical active hyperemia, gradually reestablishes the normal circulation, increases nutrition, sexual development and functional activity, and in time restores normal potency. It is a good thing for any old man to do this three or four times every week; a sense of sexual preparedness makes him feel younger and creates an interest in life, whether he cares about exercising his sexuality or not. Improvement of sexuality is usually noticeable in the course of a month or so—oftener in much less time; in other cases it is the work of several months; all depends upon the case; many of the patients get discouraged if they do not feel like twenty-one after using it a few weeks. As a rule, within a few months material beneficial results will reward faithful persistence in the treatment. Reference is here made to purely functional debility, without structural organic complications. These are almost always present, in the shape of prostatic troubles, frequent urination, dribbling of urine, inability to hold the water long, getting up nights, etc., due to prostatitis and hypertrophy, in those between fifty-five and seventy. I cannot discuss these cases now; it would take a chapter to do so. These form by far the larger proportion of cases of sexual impotence met with in genitourinary practice, and it is evident that these causal complications must be ameliorated or removed before we can reasonably expect to accomplish much in the way of restoring virility. In fact, after the removal of the causal complication, the improvement of the circulation speedily revitalizes and invigorates the organs.

I am in accord with Dr. Morrow (4) that the exercise of the sexual organs within due limits, has the effect of strengthening, invigorating and preserving them in their full integrity, while the opposite condition is produced by undue continence; and with Dr. Vecki, that in many cases treated, or rather maltreated, by all kinds of local applications, milked, massaged and bruised, they would receive much more benefit from regular sexual intercourse. The vesiculæ seminales, the prostate and neighboring glands, as he points out, are oftentimes clogged with the products of their own secretions, the result of which is passive hyperemia and its consequences. In all cases in which a physician might massage the prostate and milk the seminal vesicles, you may safely order regular sexual intercourse, the natural way of emptying these glands of their secretions.

But the trouble in these cases is that it is in this

very condition that the patient is partially or wholly physically incapacitated by loss of erection for taking this advice. The employment of the crippled function is as essential as the passive exercise of a crippled arm or leg. In these cases, a mechanical appliance, or obturator, for supporting the intro-mittent organ at its base, and supplementing the erector muscles of the penis in their efforts to close the openings through which the blood returns as fast as it enters the organ, is a *sine qua non*. It must be constructed so as to produce no structural injury, such as undue closure of the urethra, thus arresting the ejaculation of the semen, which has been one great objection to most devices proposed for the purpose. Impotence, due to paralysis, atrophy, or decay of the posterior columns, in which there is absolutely no motive power to graft upon, are necessarily hopeless.

If an appliance is used, due care must be exercised that while it exerts sufficient pressure on the corpora cavernosa and the vena dorsalis—not to arrest entirely, but to diminish the outflow of blood, it must in no case compress the urethra sufficiently

to interfere with the free ejaculation of the semen, as the reflux of the discharge against the prostate speedily kindles an acute form of prostatitis, accompanied by hematuria.

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- 295 THIRD STREET.

Treating Syphilitics*

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INTRODUCTION.

This paper has been named Treating Syphilitics rather than the Treatment of Syphilis because it has appeared to us that one of the great difficulties today in the therapy of syphilis is that the patient is almost, if not entirely, forgotten. Routine schema are proposed, ideal courses are advanced, injection rules are laid down, and the physician takes his choice by lack of familiarity with all, or by preference to the combination of six, or of seven, or of twelve, or whatever numerical formula appeals to him for the moment.

DRUGS.

In this communication and at this place we limit ourselves to the specific drugs, or those found or designed to combat the causative agent, the *Spirocheta pallida*. The mercurial preparations—and, historically, mercury is the earliest antisymphilitic—may be indicated as those for external application, for oral administration, for intramuscular injection, and for intravenous introduction.

In 1910, Ehrlich introduced to the medical world the results of his experiments to produce a drug having the greatest poisonous action on the cause of syphilis, and yet, at the same time, having almost no harmful effects on the living tissues of the patient. This drug was salvarsan, a synthetic arsenic compound, officially known in this country as arsphen-

amine. Within a short time after its introduction the results of the use of the drug in every possible manifestation of syphilis proved that a specific had been found. Although Ehrlich's idea that one dose of salvarsan would sterilize the patient has not been sustained, the drug today is our standby in the treatment of syphilitics. Ehrlich did not stop with 606, but proceeded with his experiments until 914, or neosalvarsan (neorsphenamine) had been produced.

Just prior to his death, Ehrlich produced a newer drug called sodium salvarsan (sodium arsphenamine), which combined the good features of 606 and 914.

In 1918, Kolle, who succeeded Ehrlich, produced silver salvarsan (silver arsphenamine), which had been suggested by Ehrlich. The rationale of the combination is the reduction of the arsenic dosage by the introduction of the silver component. The preparation is said to be twice if not three times as potent as old arsphenamine. According to Kolle, the ratio of *dosis curativa* to *dosis tolerata* is one to thirty. Solutions of the drug lead to a neutral reaction of the fluid, which is less oxidizable than neo compounds, but, if oxidized, preparations of silver arsphenamine are toxic. The natural color of the solution is brownish. In very dilute solution there is also a suggestion of red. Some men have found the color a disadvantage because they have been unable to judge if the solution were proper or

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not, and also because the technic of using a syringe and telling if the needle were properly introduced into the vein by withdrawing some blood is not feasible. Neither of these objections appears to be valid.

The solution of silver arsphenamine should be made with about twenty c. c. of freshly distilled water, or four tenths per cent. saline to the decigram, and in the cold. Agitation is not advised. The fluid may be filtered. The injections should be carefully given, and the drug slowly administered. The doses vary from one tenth to three tenths gram, and few men have advised larger doses, although it has been suggested. The interval between doses has been from twenty-four hours to four or five days. The number of doses given has also varied from six to sixteen, and the number of courses has depended on the stage of the disease, and the reaction therapeutically.

Byeffects and illeffects of silver arsphenamine have been dilated upon by various writers. The angioneurotic symptom complex is supposed to be seen with greater severity than following other forms of arsphenamine. Rise in temperature has been reported. Icterus and exanthem have also been reported, and several isolated grave cases of the same. Bona fide agyria has never been reported.

As the result of an extremely short personal experience (1) and study of the literature, it seems that silver arsphenamine will be a popular drug that will ultimately find a niche in the treatment of syphilis.

We digress here to speak of a nonspirochetocidal but valuable drug in syphilis. Potassium iodide was first recommended in the treatment of syphilis about 1834 by Wallace. Jobling and Peterson have recently explained the action of the iodides as follows: The softening and removal of caseous necrotic material from a gumma is due to tryptic ferment. The gumma, however, persists and remains firm because it contains large quantities of antitryptic substances which are of lipoid nature, being combinations of unsaturated fatty acids. Their power of antagonizing the ferment depends upon their saturation, which in turn can, as is well known, be satisfied by iodine, this forming the well known index used in estimating unsaturated fatty acids. Administration of iodine by saturating the antitryptic substances destroys their power over the tryptic ferments, which then dissolve the caseous material.

These, then, are the trinity of the modern drugs at our command for the treatment of the syphilitic, and it is a judicious use of one or more than one of these in order, or in combination, that makes for the treatment of syphilis. The patient requires more than this, however, and considerations of living conditions, working hours, mental attitude toward the disease, social and marital obligations, have to be fully investigated and properly settled. The matters of food, drink (especially spirituous liquors), and smoking should be mentioned, and directions or prohibitions given as the exigencies of the individual case demands.

It should certainly not be taken for granted that the patient who is a known syphilitic has only syphilis to contend with. A complete physical, neu-

rological, including ophthalmic, urinary and serological examination should be made. The mistake of accepting a positive Wassermann test as proof of syphilis, and therefore without further clinical confirmation diagnosing a presenting symptom as syphilitic, should not be made. Although a report of four plus Wassermann from a reliable and painstaking laboratory undoubtedly means that the patient has or has had active syphilis, many persons who give a positive Wassermann reaction may also have some other disease. This is important to keep in mind in cases of new growth which may be clinically difficult to diagnose. The positive serological finding may prove a deciding factor for the physician to initiate antisyphilitic treatment, and much time may be lost before the true character of the lesion or symptom is recognized and the proper therapy instituted.

PROPHYLACTIC TREATMENT.

We have recently published (2) our observations and abstracts from the literature on the prophylactic treatment of syphilis with arsphenamine. Although Metchnikoff's method of local application of mercurial salve is a recognized effective method if properly done within one hour after the *Spirocheta pallida* has been passed to the healthy person, it is not so well recognized that the injection of arsphenamine in proper doses and at proper intervals is a certain prophylaxis against the disease, even if the injections are begun as late as perhaps three days after the contamination and possible infection. We quote from the summary of our paper: ". . . The injections of arsphenamine in small doses in persons who present no lesions, and who are definitely known to have been exposed to syphilitic infection, has in all the cases resulted successfully in acting as a prophylactic measure. The time since exposure has little bearing on the result, but must be taken into consideration when the minutæ of the procedure are under consideration. In two reported cases, a single injection has been held to be ample. In a patient under our own care, we intend to use a modification of the abortive cure, although she presents no lesions, because the date of the first exposure is longer than the usual incubation time of syphilis." As far as we are able to ascertain there are no reports of the failure of arsphenamine to prevent syphilis when injected during the incubation time of the disease.

ABORTIVE TREATMENT.

Every penile lesion and any suspicious extragenital sore is examined for *Spirocheta pallida*. The primary lesion of syphilis may simulate any and every variety of nonspecific sore. We use as routine the dark field method of demonstrating the *Spirocheta pallida* (3). The demonstration of the organism is proof of syphilis, and treatment with arsphenamine is instituted at once and adhered to in order to eradicate the disease. The period prior to the wide diffusion of the syphilitic organisms—that is, the period of the chancre, negative Wassermann, and no evidence of secondary symptoms—is the primary stage of the disease. This stage is most successfully attacked with intravenous arsphenamine in otherwise healthy persons by the intensive treatment. The intensive method (4 and 5) as used by

us consists of the daily administration intravenously of arsphenamine for three doses. The dose is one decigram for each thirty pounds of body weight, dissolved in freshly distilled and boiled water, neutralized with sodium hydroxide.

We have also used the modified intensive treatment, where it has seemed desirable not to force treatment, and have given arsphenamine on every second day. The clinical results were astounding. Syphilitic lesions disappeared within a few days, and the patients were no longer a menace to themselves or to others. Although we are not willing to let the patient's future rest with the single three day-three dose or a modification of that method, we are certain that in most if not all early initial lesions such an intensive course is sufficient to rid the patient of his infection. All of our cases, however, receive a second course about six weeks after the first.

The serological and clinical results have been exceedingly gratifying with this mode of treatment. No case has clinically advanced from the primary to the secondary stage, nor has there been any suggestion of a positive Wassermann.

Although we have had no personal experience with the following, we have considered injecting three doses of arsphenamine in selected cases of early syphilis within a period of twenty-four hours. This method has been proposed by Scholtz. He states that such a course is sufficient without further treatment. We would not rely on it alone.

SILENT GENERALIZATION STAGE.

The phase of syphilis next advanced from the primary stage is one to which we have appended silent generalization stage (6). The chancre is present, there are no clinical skin or mucous membrane lesions, yet the Wassermann is strongly positive. It has been our observation that the draining lymph nodes are enlarged in this period. The spirochetes are free in the blood stream, but no metastatic distant foci have had time to make themselves evident clinically. Patients who are in this group are given the intensive course of arsphenamine, repeated two or three times, or, if the patient shows no ill effects from the injections, a course of six or even more intravenous arsphenamine injections may be given in one series, one injection every other day. The urine is carefully watched for any disturbance, and of course evidence of disease of the urinary apparatus is a contraindication for intensive therapy. Whether to give mercury concomitantly with the arsphenamine in this stage, or to wait until the cessation of the course, is still a problem; but we have considered that the body has enough to do with the elimination of the arsenic, and the internal rearrangements due to the disease, and we have not thought it wise to add another poison to the system, namely, mercury.

CLINICAL GENERALIZATION STAGE.

In the secondary stage of syphilis the spirochetes have found lodgement in all the tissues of the body, and the defensive perivascular and perilymphatic infiltration of the host may prevent their immediate destruction in every location, even by antisiphilitic medication. Once a syphilitic, always a syphilitic,

does not hold true in the primary stage of the disease, but a certain percentage of secondary syphilitics, especially those who evidence severe cerebral symptoms in the secondary period of the disease, may never overcome their infection, in spite of therapy.

According to the physical appearance of the patient and the nature of the functions of his excretory organs, vascular apparatus, and other systems, we decide the method of treatment to be instituted. Often, especially if it appears to us that the patient is being overcome by his infection, we delay arsphenamine injections until after the injection of mercury intramuscularly. Ordinarily, we use the soluble cyanide, but occasionally, and as a routine measure earlier in our experience (7), we used the insoluble salicylate. Arsphenamine may then be injected every day, especially if we have the patient under our control in bed at home or in a hospital. Injections of arsphenamine every other day for other cases may be given, especially to ambulatory patients or those unable to give up the time required every day. The interval between injections may be lengthened to four days, or even to a week, if it appears to us that the patient, by reason of the character of the reaction to medication or by failure of his kidneys, is a poor risk. In this respect we have more regard for the patient than for his disease. For similar reasons we would not ordinarily give mercury during the courses of arsphenamine, although occasionally, in robust, young syphilitics, we have done so with very favorable effects, and absolutely no ill effects. The main point in the treatment of the frank secondary syphilitic is to recognize that the disease has had a grand opportunity to get into every and any organ, tissue, and cell of the patient. Maximum treatment, rather than minimum treatment, should be insisted upon. The ordinary rules for cessation of treatment cannot be given or followed. Even after the eruption has disappeared, even after the Wassermann has become negative, treatment at regular intervals should be insisted on, and it should be good treatment—arsphenamine and mercury, not a few drops of potassium iodide solution at the whim of the patient, or some mixed treatment in the very convenient mixed treatment pill.

LATENT SYPHILIS.

The period following the clinical retrogression of the widespread secondary symptoms, either with or without treatment, we speak of as the latent tertiary stage. It is the stage of potentially active syphilis. Generalized eruptions may recur, or isolated lesions manifest themselves as gummata of the skin, bone, or any viscus. Latent tertiary syphilis is most resistant to treatment. The blood serology either remains persistently positive or becomes negative for short periods only. During the course of treatment the Wassermann may be favorably influenced, or the provocative action of therapy may act, and only after cessation of treatment does the Wassermann become negative. Resumption of treatment usually provokes the positive reaction. It is thought that well organized foci of spirochetes are present in this stage that neither the natural nor aided forces of the body are able to destroy. Treatment in the

latent tertiary (either Wassermann negative or Wassermann positive) syphilitic should be maintained periodically as a prophylactic against an uncontrollable outburst. The absence of symptoms may make it difficult to keep the patients under orders, but the importance of treatment should be successfully imparted. During this stage of the disease, periodical clinical and laboratory examinations should be made. The spinal puncture is recommended as being especially indicated in this stage in all cases.

The use of the Wassermann reaction as a routine measure in the practice of most physicians and in most hospitals has uncovered a large number of latent syphilitics who have positive Wassermann reactions. Not always, as mentioned above, does this mean that the presenting symptom is syphilitic in nature, and here, as everywhere else in medicine, clinical knowledge must come to the aid of the physician. However, many of these Wassermann positive cases are brought for antisymphilitic treatment, and it becomes a nice question to decide how the patient is to be treated. The age of the patient, and not necessarily the chronological age but the tissue age of the patient, is taken into consideration. The patient is not treated in a routine manner. Arsphenamine in smaller doses and at longer intervals is given, mercury is injected, and we prefer the soluble cyanide given every other day to the insoluble, more painful salicylate or grey oil. Potassium iodide by mouth in increasing doses, or sodium iodide intravenously in selected cases, is part of the medical program in the later stages of syphilis. Tissue reactions are watched for, especially those due to the medicine employed. We never fail to examine the urine before each injection of arsphenamine, and if there is any sign of a reaction of any kind, treatment with the old arsphenamine group is stopped, and after a proper interval we may change to the neogroup as being less toxic. The neurological examination in the late syphilitic is even more important than in the early case. The ophthalmoscope is utilized as a routine measure. The gait is watched. Sensation is investigated, and if the symptoms point toward nervous system involvement, the spinal fluid is examined early in the treatment course. After a series of intravenous, intramuscular and oral treatments, the fluid is again investigated, and if the indications are that the modes of treatment are inadequate for the case in hand, intraspinal therapy may be instituted according to the possibilities of avoiding further destruction of the nervous tissue.

ACTIVE TERTIARY SYPHILIS.

The treatment in this phase of the disease is little different from the preceding. Local ulcers or individual indications may require symptomatic treatment. The heart and bloodvessels may present changes which indicate changes in occupation, long periods of rest, or graded exercises. Involution of active gummata, gummatous infiltrations, and poor granulation tissue of broken bones, etc., is sought by arsphenamine and mercury and the iodide in doses compatible with the physical condition of the patient. We may give mixed treatment in these cases, or restrict ourselves to mercury injections or

even mercury by mouth, or inunction if more drastic treatment appears at all dangerous. Selected cases may be tried on office administration of arsphenamine; others may be restricted to bed for several hours before and after injection. In the main the doses are small, but they may be repeated more often; that is, over a longer period of time. The prevention of further lesions should be kept in mind always.

SUMMARY.

1. The patient with syphilis, and not syphilis should be considered by the physician when it comes to treatment. The tissues of the patient are worthy of respect, especially when one considers that the assault of the drugs needed in treatment is added to the tissue damage of the spirochetes.

2. Specific treatment of the syphilitic requires arsphenamine, or one of its newer salts, nearsphenamine, sodium arsphenamine, or silver arsphenamine. Mercury is also used in the specific treatment. The iodides are very valuable, especially in the later stages of the disease.

3. The use of arsphenamine in the prophylaxis of syphilis is a phase in treatment that is very important, and its results make it worthy of wider use. Its share in the public health aspects of this disease are especially valuable.

4. The intensive treatment in the early syphilitic, both when the abortive action and the quick and thorough sterilization of the patient seems feasible, is recommended for otherwise healthy persons with syphilis. Care in selection of the patient for this form of therapy is of first importance.

5. Modified forms of injection of arsphenamine should be given according to the patient, the reactions of his excretory organs, response to drugs, and phase of the disease process.

6. Iodides form a valuable addition, and the intravenous route should be considered, especially if large doses by mouth tend to upset the patient.

7. Systematic and systemic examination of the patient should be made at intervals, with especial reference to the cerebrospinal system. When indicated, the lumbar puncture for diagnosis and treatment is advised.

8. Routine treatments in syphilis should be disregarded. Every syphilitic patient should be treated as an individual requiring attention, and not as a case of syphilis.

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15 CENTRAL PARK, WEST.

The Schellberg Treatment for Chronic Colonic Infections

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During the past five years, O. Boto Schellberg has given well over thirty-six thousand colonic treatments. The results have been so favorable that I wish to present them to the medical profession.

Schellberg has cured many very obstinate cases of intestinal infection and ailments resulting from the absorption of bacterial toxins. He has demonstrated conclusively the practical value of the long rectal tube for irrigation and cleansing the large intestine. X ray photographs show clearly that such a tube may be passed through the colon as far as the cecum. We, as medical men, know that a large number of chronic pathological conditions are traceable to the absorption of putrefactive elements from the colon. These putrefactive elements are either the bacterial toxins themselves or are formed by the action of bacteria on proteid matter held in the colon.

The infant comes into the world with a sterile gastrointestinal tract. A few days after birth this sterile field becomes a garden spot for many bacteria. In the baby's gut two processes begin early, one fermentative and the other putrefactive. The lactic acid fermentative processes should be always in control, but if through faulty diet, carelessness, or impure food supply the butyric acid ferments and putrefactive organisms become predominant good health may be replaced by sickness and disease. As a child develops, the difficulty of keeping the proper healthful balance between the good lactic acid fermentative processes and the evil putrefactive becomes greater. We have with the coming of teeth more difficulty in keeping the oral cavity properly cleansed; meat, eggs and other foods causing more putrefactive activity in the gut are added to the diet.

Metchnikoff and Lane were among the first to trace chronic disturbances to infected or diseased colons accompanied by more or less displacement. They came to the erroneous conclusion that the colon was a useless remnant of a formerly necessary anatomical structure. Lane developed and advocated a short circuiting operation. He made an anastomosis between the small intestine and the sigmoid, eliminating the colon from functional activity. The result of Lane's operation discredited his hypothesis that the colon was an unnecessary part of the human digestive system.

Later and more logical researches have proved that the colon is worthy of its place in our bodies. While many disorders have their origin in the colon, this is due not to its being a superfluous part but to our misuse of it. Improper diet, overeating, lack of care for the hygiene of the mouth, and an attempt to conform Nature's excretory demands to the conveniences of our daily tasks, are a few of the abuses that combine to make such a burden to the colon that it ceases to function properly. We have resulting colic, flatulence, constipation, hemorrhoids; later, stasis, ptosis, general lack of tone in

the intestinal walls, a symptom complex of non-drainage.

Following, as a result of these disturbances, we have varying gastrointestinal symptoms, autointoxication with the many systemic diseases which follow this condition from the absorption of the bacterial poisons or the bacteria themselves, genitourinary infections from the passage of germs through the overstrained or damaged mucosa of the large intestine through invasion of the lymphatics by the infective bacteria. The colon, a useful organ, is converted by ignorance, carelessness, or disease into a menacing bacterial incubator.

The problem of keeping the colon actively healthy is now receiving much deserved attention. The treatment perfected by Schellberg from his original method has for its fundamental principle the use of lavage by which all parts of the large gut can be reached and cleansed by antiseptic solutions. Following the cleansing and the disinfection of its walls, he has carried the treatment to a cure by adopting Nature's means of preserving the balance of power to the beneficial organisms by planting in the cleaned and sterilized gut pure, healthy cultures of *Bacillus bulgaricus* and *Bacillus acidophilus*.

The treatment employed calls for a special but not complicated equipment: A three gallon irrigator connected with a three quart irrigator; a forty-six inch rubber rectal tube stiff enough not to bend on itself or be blocked by intestinal pressure, the tip sufficiently flexible to pass around the flexures of the colon; pure culture of the *Bacillus bulgaricus* and *Bacillus acidophilus* in the incubator for seventy-two hours; culture tubes for obtaining growths to determine the character of the intestinal flora.

The most satisfactory solution for the large container is found to be one tenth of one per cent. chlorazene, as chlorazene does not absorb readily. The temperature of the liquid in the large container should be kept at 37° C. One to eight thousand collene (a colloid of silver), one to thirty thousand chinosol may be used in the smaller tank. The temperature of this solution to be kept at 52° C. for use. The irrigators should be placed at least three feet above the patient. A large connecting tube from each passes through a three way valve connection. This in turn is connected to the rectal tube. If you wish to inject an oily substance, such as kerosene or turpentine, use a ten to twenty per cent. ichthyol solution as a medium. This emulsion is best forced through the rectal tube by a hard rubber syringe. The giving of a cathartic will aid in the cleansing process.

The observation has been that the sigmoid lies most generally in the central line, the normal inclination being to the left side; a few have been found on the right. As a rule, Schellberg begins the irrigation with the patient lying on the left side to gain the slight advantage of gravity. With the

rectal tube completely filled with the solution from the large tank, taking great care that all air is expelled from the tube, the tip is introduced into the rectum. Allow ten ounces to flow into the rectum, shut off, and permit the gas and any fecal matter present to escape. When the rectum is

can easily trace the gut as it fills, except where the abdominal walls are very thick and the intestine lies close to the back. Even in such cases practice will enable you to detect and trace it. When the tube has reached the splenic flexure, place your patient on his back, and, by the aid of the water

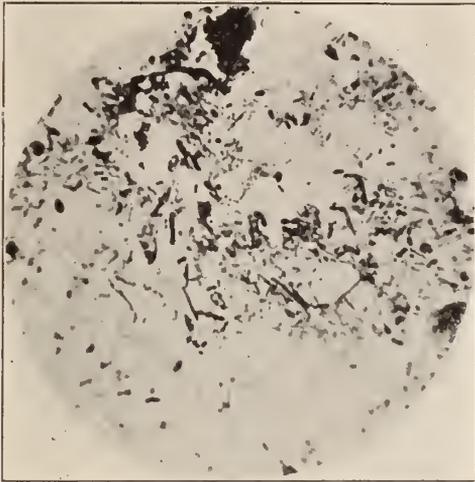


FIG. 1.—Culture taken before treatment.

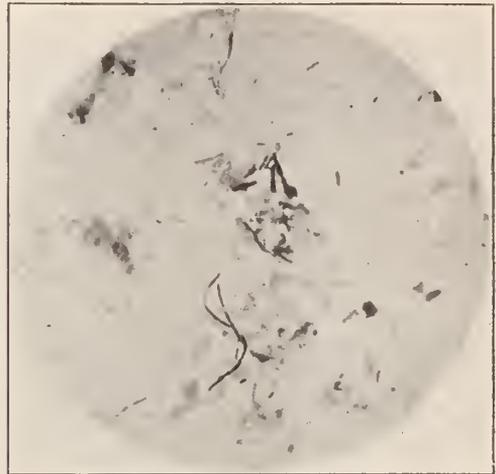


FIG. 2.—Culture three months after treatment.

clean of feces, turn on the water, dilate the gut, and begin feeling your way up into the intestine with the tube. Never try to advance the tube without the water flowing. After proceeding a distance, it is wise to shut off the flow and allow the expulsion of the bowel contents. Again turn on the water and proceed to advance the tube further. Go slowly, be gentle, persevere, and you will reach the ascending colon, and possibly even the cecum, no matter how misplaced, posed or pocketed the gut may seem. Gentle perseverance with the water pressure will allow you to reach your goal, unless there is some growth obstructing the gut.

pressure, make the turn. With a little patience, the tip of the tube will pass that turn into the transverse colon. Here one may need to turn on the solution from the small tank, and, by the heat of this solution, to excite upward peristalsis to carry the tube farther. Once beyond the flexure, irrigate before proceeding.

At first the treatments were begun solely for cleansing the gut. As Schellberg followed certain cases, he found that he not only cleansed the gut, but, where there was marked prolapse and displacement, even where the colon had been bound down by adhesions, persistence for a time freed the intes-



FIG. 3.—Culture at beginning of treatment.

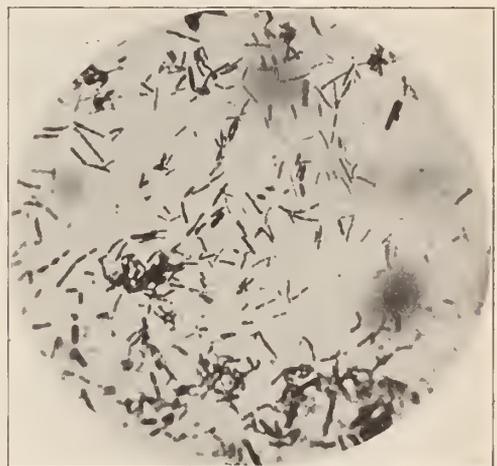


FIG. 4.—Culture during treatment.

One must learn to differentiate the feel between the tip of the tube striking a fecal mass and the wall of the intestine. If you do not learn to differentiate, you will not have great success with the procedure. As the water flows into the bowel, with one hand on the patient's abdomen, the operator

time, made it normally movable as well as relieving the sagging and ptosis. The correction of the sagging and ptosis was to be accomplished by a removal of the abnormal load of fecal matter and by the stimulation of the cleansing. The freeing of the gut from adhesion was not expected, but is

forming one of the most gratifying results of this treatment.

The study of conditions within the abdomen on the operating table and from autopsies teach that intestinal pockets are common in the colon, formed, as we know, when two inflamed surfaces lie close together in the lumen. The exudates from the

and resume their normal anatomical position after ten days of treatment. The parting of the binding adhesion may give the patient a sharp, stabbing pain, which is of short duration.

Schellberg has learned that until the colon is fairly sterile no lasting benefit is to be gained by the planting of the *Bacillus bulgaricus* or the *Bacillus acidophilus*. His method is to wash the colon daily with the antiseptic solution until the smears show a low bacterial count in the gut. The desired sterile condition is achieved in ten days with the average case. Streptococcus and staphylococcus organisms must be reduced to the minimum before planting.

Not infrequently a case is met in which the antiseptic solution causes such an irritation that one must stop the irrigation before the desired cleanliness is obtained. Into these irritable colons Schellberg introduces a one per cent. solution of dextrose, and a planting of twenty to thirty billion acidophilus and bulgaricus is made as high up in the gut as possible. After three or four of these daily plantings the intestine is usually quieted so that the disinfection can be resumed.

A few cases which had apparently been in condition for the permanent planting later showed increased or renewed streptococci and staphylococci after two weeks. In such, he disregarded his plants and renewed the disinfection. With the acidophilus on the increase with the absence of streptococcus and staphylococcus organisms, a chance of recurrence is not great. With ordinary care and diet,



FIG. 5.—X ray showing ptosis and misplacement of colon.

inflamed surfaces coalesce, consolidate, and form a band of tissue which contracts, pulling the two points together, forming a pouch in the intestine, the blind sacs making perfect bacterial incubators. (To these exudates, Schellberg has given the name intestinal interlining adhesions.) No cathartic or intestinal antiseptics given by mouth will clean these. Nor will the usual enemas remove the contents of such a pocket. The irritation caused by the bacterial growth in these pouches causes a reaction on the walls of the intestines, with the throwing out of a serous exudate which later becomes organized, forming the so-called adhesion, binding the colon to the abdominal walls or some intraabdominal structure. As a result, there is a colon which has not only lost its mobility but has become an incubator for bacteria and a producer of toxic material. He found that by passing the tube over these pockets daily with the stretching of the colon, his solution loosened these interlining adhesions, which were expelled, and at times would break loose some of the external adhesions. Sometimes this happened during the treatment, causing the patient sharp pain. More frequently it came after the lavage. With the opening of the pocket and the removal of the irritating accumulation, the adhesion bands immobilize the organ, atrophy, and give way. He has seen misplaced immobile colons become mobile



FIG. 6.—Ptosis and displacement of the colon shown by the x ray.

patients have shown a vigorous growth of acidophilus two years after this treatment.

For planting, Schellberg uses four ounces of a one per cent. dextrose solution, containing twenty to thirty billion acidophilus and bulgaricus, injecting this into the ascending colon or cecum. The tem-

perature of this solution should be 50° C., a planting made daily for from four to seven days, and then every second day for four or five treatments. The patient is placed on the right side for the planting. Before injecting the plant, be sure that all the solution used to introduce the tube has been expelled and that peristaltic action has become quiet.



FIG. 7.—Culture before treatment.

Following rectal plant the patient should remain quiet, lying on the right side for thirty minutes after the planting. After colonic treatment is discontinued the patient is instructed to continue taking active liquid cultures of *Bacillus bulgaricus* by the mouth.

In unbalanced states of thyroid secretion the careful physician has long recognized the necessity of carefully studying his patient for some foci of infection as a basic cause for, not only conditions of hypothyroidism, but hyperthyroidism as well. In cases of deficiency of thyroid secretion, or hypothyroidism, attended by pallor, languor, a general feeling of muscular weakness, and a general lowering of all body function, with enlargement of the gland, some very interesting observations have been made.

Some physicians have the teeth and tonsils carefully gone over before beginning the use of thyroid extract in cases of hypothyroidism, and some have even gone further and, realizing that the intestines might be the possible carrier of the infection, have attempted to clean them out by brisk purging. Often discouraging failures have followed the use of thyroid extract for reasons which Schellberg has been able to demonstrate in an interesting series of cases.

When patients presented themselves with typical symptoms of thyroid deficiency, coupled with distinct enlargement of the thyroid, the colon was thoroughly cleaned out and a healthy growth of *Bacillus bulgaricus* and *Bacillus acidophilus* implanted, and no further treatment was found necessary. The use of thyroid extract was not found necessary, because as soon as this source of infection had been removed the symptoms disappeared, and a decided reduction in the enlarged thyroid promptly followed. This emphasizes the importance in all unbalanced states of thyroid secretion first to clean

out the colon thoroughly by the methods followed in this treatment, never failing, of course, to give attention to other possible regions where foci of infection might be located.

Schellberg has been able to demonstrate that many of the debilitated patients show an excessive growth of staphylococcus and streptococcus in the colon. Schellberg also states that weakness and debility are not contraindications for his treatment. On the contrary, he has found such patients to be improved from the very beginning of the treatment. The amount of water absorbed by patients during lavage is marvelous. This water is rapidly eliminated by the kidneys; patients urinate quantities immediately following the treatment.

It has been found of decided benefit to patients suffering from pyelitis and certain forms of cystitis, because by this means large doses of urinary antiseptics can be given without the debilitating effect they have on the patient if given in any other manner. As an example, 380 grains of sodium salicylate can be thrown into the cecum at one dose. The patient will say that he can taste it within fifteen minutes, but he will be entirely free from the usual disagreeable symptoms a large dose by mouth would produce.

Schellberg has found that when a hot solution, given from the second irrigator at a temperature of 52° C., was thrown into the cecum, when the ileocecal valve was relaxed, some of the hot solution may by backward peristalsis be carried into the ileum. This at times will produce a chill which does not as a rule last long, and no serious consequences follow.

Finally, physicians must remember that the colon is a movable organ. It is not fixed, as is generally supposed, but can be moved by the rectal tube quite freely about the abdomen. A loop, twist, or kink of the colon may or may not be due to an adhesion, as more often the colon pulls itself into loops and as

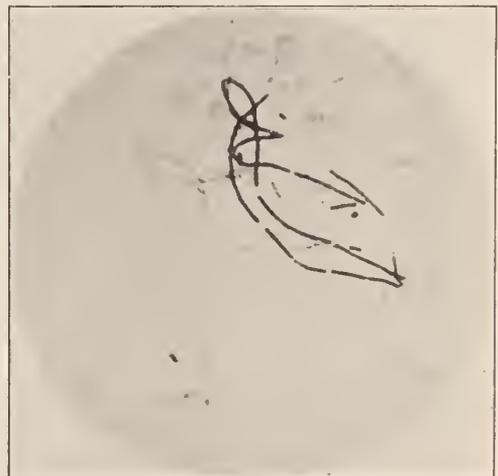


FIG. 8.—*Bacillus bulgaricus* a year after treatment.

easily uncoils, sometimes due to an extreme peristaltic action and sometimes in trying to expel masses of feces.

The x ray plates demonstrate the marked ptosis and misplacement of the colon met with in some of these cases.

A Coordination or Reestablishment Clinic in Hospitals and Dispensaries

To Furnish the Patient a General Survey, to Recognize and Remedy Minor, Associated, or Beginning Ailments, and to Raise the Coefficient of Efficiency in the Organism as a Whole

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The enterprise of restoring health by no means ends with the repair of an obvious or urgent ailment. Ill health almost never is a single maladjustment of function, even in the most acute conditions. Back of the dominant feature lies yet other sources and weaknesses, earlier disarrangements, or persisting effects of disorder or disease. So true is this that human beings die only rarely of an acute disease but perish by reason of lowered planes of energizing, of overwhelmed defense reactions and vulnerabilities, constituting terminal phenomena. In adults, notably in those of late maturity, these phenomena are recognized as grouping themselves along certain familiar organ systems forming disorders—conscious or unconscious impairments—distresses or decrepitudes, in varying degrees but all capable of mitigation when approached judiciously.

We habitually deplore not being able to have had a seriously compromised patient under observation long before the presenting conditions had grown so complex or obdurate. When the patient has come under observation why not make sure that he or she shall not now escape until our utmost has been done to set them safely and confidently on their way? In private practice this enterprise can sometimes be carried out when we are permitted or encouraged to prolong our supervision. As the golden age of cooperation nears we shall be increasingly able to fulfill our plainly realized obligations.

In the instance of the hospital patient we chiefly have to do with those less alert to their condition, less able to afford the time and expense of completed restitution. These wage earners need, even more urgently, to achieve a sound plane of productivity. And yet this result can be handsomely approximated in the dispensaries among walking cases, by economizing the time of those still under treatment for one disability by directing patients to go from one special department to another, and thus secure relief from whatsoever ill defined disorder may be observed. Yet there often pass unrecognized manifold ailments or latent diseases, or beginning disablements, which deserve a thorough survey, recognition and treatment. The fact is, most patients shrink from admitting collateral ailments. They should be solicited and guided. Moreover, it is a fact, not commonly known, that any one can give their attention to only one misery at a time; there may be others but they sink into the background of consciousness. When the most obvious is removed, these others may come into the field of attention. By that time the dispensary patient yields to the urge to get home and remain at home, to cease complaining. Thus many minor and some grave maladies escape attention.

Students, or young graduates, could learn much from a complete systematic survey of such clinical material as this under the direction of a mature, experienced, all round teacher. Assuredly there would be found many clinical conditions which would profit by the searching out of subsidiary or collateral ailments or disabilities, notably such as come under the domain of so-called physical therapy, better orthokinetics, the modalities of motion, and of systematic developmental measures.

The enterprise of readjusting structures and functions, of reestablishing disordered reflexes through influencing the sympathetic as well as the spinal reflexes, is coming to be a large and increasingly significant domain of human betterment. Along with the physical are the mental readjustments, needed less or more in every protracted or chronic condition, and in most acute states, especially in those hypersensitive, apprehensive, or bewildered.

Hence in my judgment there should be a special clinic or clearing house to investigate the status of the case in its entirety, while undergoing treatment in any one department.

REASONS FOR A DEPARTMENT FOR HUMAN ADJUSTMENTS IN DISPENSARIES.

In every systematic dispensary group there should, in my opinion, be organized a special clinic to which should be referred practically all cases for determination of any latent or obscure phenomena deserving attention, for the remedying of distressing residua or complications, and for general and particularized integration.

Such a special department might be defined as a reestablishment clinic. From this the patient when coordinated or cured goes forth with some confidence that he or she has received a rounding out of advice, whereby a reasonable expectation can be had of restored health and productivity.

In any patient seeking advice, there are oftentimes subsidiary ailments long existing, overlooked, not sufficiently distressing to suggest seeking relief, but which might readily act as a factor for complicating the dominant distress or disability and in a degree nullifying the good effects of the advice already sought and received. Furthermore, such subsidiary ailments might frequently become starting points for yet further troubles, whereby the individual remains below par and unable to resume the full responsibilities of social or domestic or industrial undertakings.

While it may be assumed that the dispensary chiefs, specialists in any one of the various lines of medical endeavor, do try to discover all collateral disorders, it is only too true that, in a crowded serv-

ice, many essential points or weaknesses or ailments do escape attention. It is also true that when some factor is suspected outside the purview or jurisdiction of the chief, the case is, or can be, directed to one or the other of the definite departments. Too often, however, in the hurry many escape needed attention, after the major problem has been disposed of.

Provision should be made for any concurrent ailments, mental as well as physical, complicating the problem and which deserve, indeed demand, attention, in the best interests of the individual as a suffering, or an inadequate human being. Here we have the justification of the department suggested, a clearing house for not only the conditions now recognized as conventional, but for that large group of reflex conditions which as yet are only grudgingly admitted to exist, or even are frankly denied.

In such a clinic the first work would be to search for findings, to appraise the possibilities for rendering service, and for affording instruction to students in solving unfamiliar yet significant problems. Ample justification and special classification would in my opinion be found. All cases should, indeed, be referred to the reestablishment clinic for extra attention to collateral, subsidiary or complicating conditions and their remedy. The nature, or character, of these disabilities will be mentioned later.

Relief along these lines, moreover, might readily go far toward fortifying the individual to recover constitutional vigor and do greater justice to the primary advice. The kind of counsel I picture in my mind is not only that which could be got at the so-called medical dispensary but something much more, and outside the domain of that department as now constituted or executed.

In such a clinic for reestablishment an all round, careful survey would be made of the organism as a whole, a visualization of the person and personality in its entirety, or at least so much of it as might seem needful in order to determine whether the various parts, limbs, back, neck, static and kinetic mechanisms, are in order, and wherever is disorder, distress, disability or maladjustment, to apply suitable measures for overcoming them, or to refer the case for particular treatment to the special department provided. Most ailments found will, in all probability, come within the scope of this special clinic. The scope of endeavor includes disorders of personality as well as of the material organism. Hence some knowledge is needed of neurology, of psychopathology, and of psychotherapy along with a full appreciation of biophysics and of straightening out maladjustments in the body as a biomechanism, a mass of reflexes, in short, a balancing of the defense mechanisms. To make plain this concept, I have offered the descriptive term *orthokinetics* or the rectifying of maladjustments through the modalities of motion, manipulation, replacement, manual adjustment, and guidance in motor performance; in short, volitional training in the active or kinetic phase, or in the reverse, the resting or akinetic phase, also by quieting the overacting or underacting reflexes, the release of tension, of tonic protective spasm, of intraarticular pressure, and al-

ways along with specific or particularized motor performance in accord with design and function.

Of similar importance is the undertaking of readjustment of the disorders of personality, of emotion, of the release of repression, or of suppression, of restoration from the effects of mental conflicts which enter into most of the problems of disordered life. Such measures for relief are in no sense a thing apart but implicated in the web and woof of most, if not all, human miseries and disabilities. There is always available the neuropathic or psychopathic departments for those in whom these features are pronounced and obdurate.

The qualifications of chief for the special reestablishment clinic thus would include fair familiarity with, and skill in, several special fields of medical art, as well as science. He and his assistants should be men or women of forceful personality, warm sympathy, ripe judgment, of ample and varied experiences, which should include some years in the active general practice of medicine in order to achieve powers of visualization, perspective and proportion. It is also desirable that they should have certain endowments of deftness, of dexterity, of motor common sense, and of particularized aptitudes in the domain of economic conservation, reconstruction and coordination. Also a capacity to win confidence, loyalty, cooperation; to enhance selfcontrol and selfdirection, selfsacrifice, and faithfulness in the performance of duties, obligations, contributing to recovery of selfdetermination and powers of worthy achievement.

They should have nice powers of observation and interpretation of externals, of expression, of attitude, of demeanor, of physical proportion, of symmetry, of variants in local tone or loss of tone, in color alteration, in short, of significant appearances visible to the eye, or to touch, or muscle sense (*kinesthesia*), and how they shall be appraised.

They should possess high endowments and trained aptitudes in tactile apperception, in weighing the evidence of resistance to the hands, and in rightly inferring what is amiss and what must be done in the way of physical adjustments, of setting in order disordered biomechanisms through forms and modalities of motion (*orthokinetics*). Here we have those fundamental means of restitution among which are release of repressed reflexes, of tonic protective spasms, hence of transferred pains, of faulty attitudes, of intraarticular overpressures, of compressures exerted on tubular or hollow organs, of displacements of viscera, of junctures, of nerve trunks, of subsidiary centres and similar biomechanistic problems.

Included are the resources of replacing parts in positions of advantage, of tact and persuasiveness in eliciting economic motor responsiveness, of developmental volition, in precision of purposeful performances, whereby so much of cure as can be shall be achieved. The straightening out of entanglements or decrepitudes, lameness (*orthokinetics*) is both of the mental and of the physical. In between the two lies the reflexogenic domain.

The right working of the human body depends, in large measure, on nicety in equipoise and of instrumentalities; next on the consciousness of the mus-

cle structures in organs and this again upon intelligence of reflexogenic groupings. Here set forth is a field for clinical endeavor as yet only suggested but growing in certitude and usability. We hear much of the vegetative and the autonomic nervous systems, but they work through sensitive somethings which we appreciate as reflex responses. These suffer varied and complex forms of disorder, but are capable of helpful readjustment and regulation, and through them are capable of being relieved a multitude of disorders of the vegetative and reproductive life.

It is entirely possible usefully and economically to control the involuntary motion in the tubular and hollow organs, the ebb and flow of fluids, of blood, lymph and the cruder intestinal and visceral contents.

The accessible avenues are the subsidiary centres in the paravertebral tissues whereby vasomotor, visceromotor and sensorimotor regulations can be achieved. In vasomotion we can promptly release or reconstitute vasomotor imbalance, so of the visceromotor and sensorimotor imbalance. There is also the manual or mechanistic instrumentalities of releasing many inhibited energies, of putting them back on their job, encouraged, serene and efficient.

Finally there are large possibilities for raising the plane of energizing in an individual from that on which he has heretofore functioned, and to reach a yet higher plane, partly by what has been said, i. e., placing parts in positions of advantage which had come into those of disadvantage for performance. This is to be done through attention to developmental measures both physical and psychical. In most patients latent obstacles exist to full health which can be advantageously removed by taking a perspective view of the entire organism and by applying suitable regulatory measures. In order to make my meaning more clear, I may cite some of my personal experiences.

Patients come to me, often sent by a specialist, an internist or a general practitioner, suffering from an ailment just outside the line of their familiarity of which I am able to determine the character and extent and which I am privileged to relieve or to cure. The patient returns to the primary adviser and may remain under his care, as well as under mine, till I am done or he is done or both. Not seldom the relief I am able to afford gives material aid to what he is doing for the recovery of the disordered organ or part, or even of a system, as of the cardiovascularrenal or genitourinary or digestive or metabolic system. Any one can work in complete harmony with the adviser and supplement his work.

In this connection may be mentioned a few of the conditions thus surveyed and repaired and which retroact on the sensory or energy reserves:

Local pains, disabilities, dysfunctions, backaches, headaches, neckaches, foot troubles, lameness, many of which are due to muscle pains (fibromyositis) or to minor disturbances of joints, intraarticular pressures, muscular imbalances, transferred pains, pleural, and other adhesions.

Also a large number of ailments due to impaired tone in the abdominal muscles, anterior or posterior, whereby digestive dysfunction occurs preventing re-

sponsiveness to pharmacogenic remedies. They may have existed long before the major or dominant disorder or distress, acting as part of the general handicap. Unless removed before discharge from hospital after appropriate and otherwise adequate treatment, dissatisfaction results and retroactive disturbances.

The whole topic of maladjustments is thus seen to be obviously important, and becomes of vivid interest to those who have directed their attention that way. On a later occasion I will elaborate the subject and submit a category or memorandum of clinical phenomena.

Briefly, then, let me express my confidence that when the subject of readaptation is carefully considered, it will be found to grow in importance and usefulness. Indeed it is the logical outcome of efforts at making medical art a complete and satisfactory form of beneficent welfare work. Men could be trained in readjustment whose observation will prove of vast benefit to them in future professional careers. Also the potential of the profession, the esteem in which they are held by the public, will become stronger, fuller, more dynamic. There will be far fewer loose or raw ends left to produce dissatisfaction or recrimination.

The point for particular attention is to let no element of disablement escape recognition, explanation or relief. Many points may seem trivial but they are capable of producing, or contributing to varied miseries and retardations of recovery. They may well lie outside the purview or jurisdiction of the former adviser. If suspected they could well be referred to some suitable department.

In the absence of suspicion, or in a spirit of patient endurance, the individual departs carrying away various retarding residua, disabilities, distresses, and then tends to blame the hospital or the special adviser and to ascribe unjustly the associated disorders to professional omissions or to carelessness.

It is a well established fact that one can only be conscious of one source of pain at a time; when the one is relieved another may come into the foreground of attention. So of tenderness, aches, asthenias, chronic local overstress, disordered sensations of diverse kinds. These come into active consciousness as other are relieved. There may be many of them; especially in protracted or chronic or complicated disorders, or after operation. Furthermore many scarcely noticed ailments become the starting points of severe, unremediable disease.

1504 PINE STREET.

Charcoal and Laudanum.—I. Simon (*Gazzetta degli Ospedali e delle Cliniche*, December 4, 1920) describes two strengths of the preparation, one of two per cent. and the other of four per cent. It is especially efficacious in the treatment of enteritis, as it promptly alleviates the cramplike pains of the condition and, when combined in this way, a much smaller dose of the opium product is necessary than when it is used alone. The action of the animal charcoal is to absorb and fix the toxins of the infecting bacteria.

An Unusual Hypophyseal Syndrome*

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The following case has recently come under my observation, and it presents so many unusual features that it was deemed worthy of recording in the literature:

CASE.—E. C., aged nineteen, student. The chief complaints were dwarfism and obesity, of nine years' duration, hypertension, recurrent pains in the region of the spine for six months. The family history showed the parents and one sister to be short and stout. The patient was the third of seven children. One brother suffers from petit mal. The previous history revealed measles and scarlet fever. It was not known whether the kidneys were involved at the time. His birth was normal. He developed satisfactorily until the age of nine years.

Nine years ago the patient began to grow stout. He gained much weight in two months. Since then there had been very little growth in height. His abdomen became pendulous, his fingers stubby, feet remained small, and face became ruddy. In 1915 he was treated by an orthopedist, who administered thyroid extract for over a year. He grew about two inches in height in that time. The treatment was then stopped. He felt well and went to college. Six months ago shooting pains developed in the region of the spine and chest. His urine was then examined and showed so-called kidney trouble. About one and a half months ago a pain developed in the right upper quadrant of the abdomen. This seemed to shift with change in position, and lasted about two weeks. He had shortness of breath and palpitation of the heart after exertion. His speech became somewhat hesitant. He had some impairment of memory. There was tremor after exertion. He had dimness of vision for the past two months, and occasional headaches. Nocturia was present, but no polydipsia.

The physical examination showed the patient to be short and obese, with erythema of the face and a pendulous abdomen. The mammae were well developed and the fat distribution was of the feminine type. There was an overgrowth of hair at the bridge of the nose, and the body was covered with fine lanugo hairs. The total length of the patient, standing, was 136.5 cm. (The normal for this age would be 175 cm.) His weight was forty-six and four tenths kilos. The pupils were normal and fields normal. There were two minute retinal hemorrhages at the outer side of the left disc. The teeth were a bit spaced and irregularly placed. The tonsils were moderately enlarged. The thyroid was not palpable. The lungs were negative. The heart was somewhat enlarged to the left. The aortic second sound was accentuated. The abdomen was distended. The liver edge was just palpable. The genitals were small. The fingers were stubby. The

knee jerks diminished. The skin showed ringworm in the axilla and pubis, erythema and telangiectasis of the face and striae distensae on the abdomen and thighs.

The laboratory findings were: hemoglobin, 95 per cent.; red blood cells, 4,860,000; white blood cells, 13,400; polynuclears, 76 per cent.; lymphocytes, 19 per cent.; large mononuclears, 3 per cent.; transitionals, 2 per cent. Blood pressure, 198/110. Phenolsulphonephthalein excretion test showed at the end of the first hour 35 per cent., and at the end of the second hour 24 per cent. Chemical examination of the blood showed: Urea nitrogen, 12.6; nonprotein nitrogen, 46.6; uric acid, 2.7; creatinin, 2.1; sugar, .240; cholesterin, .308 in 100 c. c. of blood. Wassermann of the blood was negative. The basal metabolism was 39, i. e., minus 5 per cent.

The patient was admitted to the service of Dr. Libman at Mount Sinai Hospital, where some of the observations included in this report were made. The dental examination showed that the lower molars were unerupted and impacted. The upper first molar was found to be devitalized and was extracted. There was considerable bleeding, which was finally stopped with thromboplastin. Temperature varied from 98.6° F. to 99.8° F.; pulse from 90 to 100. Urine showed a specific gravity of 1.010 to 1.020. There was a faint trace of albumin, sugar was present, no acid bodies. Microscopic examination was negative. Adrenalin test of Loewi for pupil dilatation was negative. Oculocardiac reflex was positive. No slowing or sweating after pilocarpine. No effect after atropine. Adrenalin test was not made, due to the high blood pressure. Libido absent; only an occasional erection. Electrocardiogram showed a left ventricular preponderance, tachycardia and sinus arrhythmia. There was slowing of the rate on holding the breath and after vagus pressure. There was a slight alteration of the size and shape of the P wave (instability of the cardiac pacemaker). There was an unstable vagus and sympathetic balance.

X ray examination of the skull showed undeveloped sinuses, the left being opaque. The sella was normal. Posterior clinoids as well as the bones of the body of sphenoid appeared markedly atrophic and thin. Entrance to the sella was narrow. There was a dense shadow in the middle fossa. X ray examination of the chest showed a shadow at the root of the neck, extending up from the aorta, and probably due to the large vessels. The aorta showed considerable dilatation for an individual of this age. This was probably due to the hypertension. X ray examination of the hands showed development of bones such as we usually see in a person of thirteen (epiphyseal lines were still present). X ray examination of the kidneys and lumbar spine was negative.

*Report presented at the meeting of the New York Neurological Society on January 4, 1921.

The patient's stunted growth pointed to a deficiency of the morphogenetic principle of the anterior lobe of the pituitary. The posterior lobe was probably responsible for the hypertension and glycosuria. The adrenal was also concerned in these abnormalities. Certainly the tendency to hypertrichosis and high cholesterolin content of the blood pointed to involvement of the adrenals. That the thyroid was implicated is shown by the fact that ossification of the epiphyses was much delayed. The skin, too, was rather dry. There were disturbances in the sex glands as shown by the diminished libido and disturbance in potency.

Thus far two main clinical types of pituitary disorder had been known, hyperpituitarism with resulting acromegaly described by Marie, and hypopituitarism leading to the syndrome of Fröhlich. Recently Reichman (1) described another type of pituitary disorder very much like this case. His patient differed from ours in that he did not show obesity and had a bradycardia instead of the tachy-

cardia seen in this patient. At the postmortem examination his patient showed adenoma of the hypophysis. During life it seemed as though there was hyperfunction of the hypophysis and adrenal, and hypoactivity of the thyroid. Probably as time goes on more of these syndromes will be described, depending upon the repressing or accelerating effects produced upon the other glands of internal secretion. In view of the tremendous interrelationship existing between them, we shall probably always find pluriglandular manifestations. The dominating changes may be ascribed to vital disturbance of one of these glands, but there are usually seen evidences of deranged function in most of the others. The physiology of these glands is so intimately concerned with the problem of life itself, that definiteness in this field is still far from the realm of possibility.

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74 EAST NINETY-FIRST STREET.

The Etiology and Elimination of Tuberculosis

By G. LENOX CURTIS, M. D.,
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Ever since Koch, in 1890, announced his discovery of a probable cure for tuberculosis, I have given this subject special consideration, not alone with a view to developing a cure for tuberculosis, but also to understanding underlying conditions that predispose to the disease. So profoundly did Koch's announcement impress me that I remained a year in the clinics of Berlin and Vienna where I had daily opportunity to see patients treated with tuberculin and to watch the results. I followed closely the effect of the treatment and noted the terrible destruction of life that followed the injection of this lymph into unfortunate patients who flocked to the cure. As a result, I came early to the conclusion that the principle of injecting the deadly bacilli of tuberculosis into persons of tuberculous tendency was wrong. I was further convinced of this from witnessing autopsies, where I realized the destructive effect of the treatment upon the system. For not only had the disease ravaged the organs, but even the marrow in the bones was dissolved into a culture bed for swarming masses of tubercle bacilli.

During the thirty years that have since intervened I have watched with keen interest the persistent efforts of those who have followed the great German leader of science along the false trail of hope, until the idea finally possessed me that the underlying cause of tuberculosis might be similar to the causes of other suppurative and so-called incurable diseases, differing only in its stage of development. To this end I quietly worked.

The facilities of the great clinics of Berlin and Vienna, where I discovered the etiology of tuberculosis in 1890, and of the Post-Graduate Medical

School of New York, to which upon my return I became attached, afforded me exceptional opportunities for continuing these studies and brought me also into contact with a number of allied diseases—notably cancer, gangrene, pyorrhœa alveolaris, and diabetes.

While in Germany, I gained some knowledge of the examination of the blood, but my persistent question, Does not the baking of the smear destroy some conditions that render an accurate reading of the blood impossible? was never answered satisfactorily until in 1892 I became a student of the American system which I consider more trustworthy than the baking and staining process. By this method only freshly drawn blood is examined which is immediately photographed for future reference. Following this work in the examination of freshly drawn blood, I was able to find indications of diseases that the old drying and baking process completely obliterated. Finally I obtained convincing proof of what I believe to be the underlying cause of tuberculosis, as well as of gangrene, pyorrhœa alveolaris, diabetes and cancer.

My convictions are based not alone upon my impressions, microscopic and microphotographic verifications, but upon long years of clinical experience. As further proof of my views I quote from Jenner: "A healthy boy, vaccinated May 14, 1796, which began the era of vaccination, died a few years later of phthisis." Stefansson, the Arctic explorer and discoverer of an isolated tribe of phenomenally robust Eskimos, states that venereal disease or tuberculosis is unknown to them. As a result, all my tuberculous patients, several hundred in number, in all forms and stages of the disease, who could have

proper care and treatment, as hereinafter outlined, were cured and remained cured.

Now, some products of the disease are less hardy than others and oxidize more quickly, for instance, tuberculous matter as found in freshly drawn blood is not found when the smear is dried. Therefore,



FIG. 1.—Tubercle bacilli found in the blood of a patient suffering from tuberculosis.

in order to see all the blood contents, the specimen should be immediately covered after being drawn, and kept at body temperature and quickly examined. For if the warm air in the lung oxidizes the blood, how much more quickly will the cold atmosphere change the form of the delicate products, or the primary signs of disease it contains? The technic in securing these examinations should be accurate and painstakingly aseptic.

In 1896 I first secured photographs of blood from tuberculous patients that distinctly showed the bacilli of tuberculosis, and again in 1902. I herewith submit two pictures (Fig. 1 and 2), one showing two normal bacilli, and the other showing many bacilli undergoing segregation. The patients from whom these blood photographs were made, were referred to me as hopeless, and from general appearance one might well accept the false prognosis. Yet both recovered their health and are now living and well. This, I believe, is the first authentic record of tubercle bacilli being discovered in living blood, also the first photographs of bacilli in living blood.

In 1889, when assistant in bacteriology to Ernest La Place, in Philadelphia, he demonstrated to me that certain germs would not die when placed in a one to one thousand solution of bichloride of mercury, but would be immediately destroyed when the solution was even faintly acidulated. I asked him why not acidulate the body when attacked with disease that progressed under albuminous conditions? He replied that such a course would be likely to result

in phlebitis, and possibly in death. However, the idea of acidulating the system affected with diseases depending upon albumin, grew upon me, and it was not long before I experimented with this method, and with astonishingly successful results.

I was born of healthy parents and was always rugged. During childhood I had measles and mumps, but no other diseases until I was in the twenties, when I had typhoid fever. I never had venereal disease. During the epidemic of smallpox in New York in 1892, rather than be responsible for carrying the disease to the homes of my patients I felt it my duty to be vaccinated. This marked the flight of my robust health and all but caused my death. I was vaccinated with fresh material from the laboratory of the board of health, vaccine that had passed the test of the double and treble \times refinery. I was very ill. During the first two weeks my temperature ranged from 106° to 110° . Another week passed before I could resume practice, or could drag myself back to my class. Long vacations in the woods kept me alive, but my shattered health caused me to abandon teaching, and finally to give up my practice and seek recovery in the sunny West. I had gradually gone into a decline until no hope of my recov-

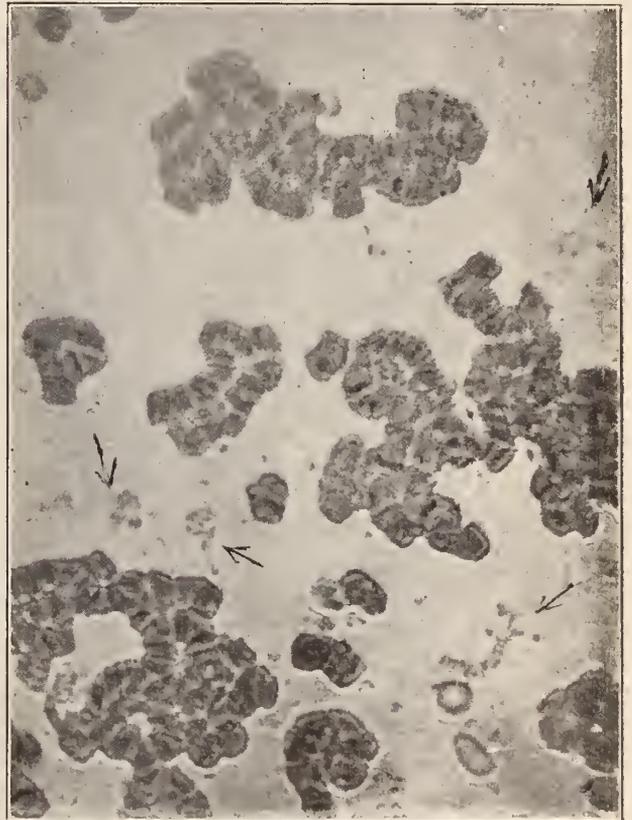


FIG. 2.—Tubercle bacilli in the blood.

ery was entertained by my physician friends, who pronounced me in the third stage of tuberculosis. The sunshine and ozone of the prairies helped me greatly, however, and within a half year's time I was able to return, to work out the discovery that ozone was the most potent factor in exterminating tuberculosis.

Prior to being vaccinated I had been a great sufferer from rheumatism, and for several months was practically helpless, being unable to dress or feed myself. Soon after vaccination, however, this condition subsided, and when tuberculosis made its appearance rheumatism had disappeared.

Examination of urine and saliva showed that my secretions were alkaline, but it was not until 1896 that I realized that rheumatism and tuberculosis were antagonistic, and that both could not persist at the same time. I found that overacidulation of the system was always present during rheumatism and was responsible for the fibrin which alone causes rheumatism. I therefore treated all cases of rheumatism with antacids, soda and ammonia, and all cases of tuberculosis with acids, until the system was acidulated. I found that by this method the alkalies dissolved the fibrin, while the acid killed the bacilli and reinforced the system against the development of tuberculosis. But it was not until several years later that I realized that by feeding albuminous substances, milk and eggs, for instance, to tuberculous patients I was unable to fully acidulate the body and to keep it acidulated until they were well, although I prescribed acid food denied rheumatic patients.

The usual classification of the stages of tuberculosis I consider too inaccurate for scientific purpose, so I divide them into five instead of three stages, as they are generally described. In the first stage, the preclinical stage, the mucus peculiar to tuberculosis, designated as tuberculous matter, is present before the slightest ordinary clinical manifestation is evidenced. This is the most important stage in which to make a diagnosis, for here a prognosis of the future health of the patient can be made with assurance. In the second, the incipient stage, the first ordinary signs appear, such as pallor, bronchitis, hoarseness, slight cough, slight contraction or possibly dullness of the apex of the lung, increase in respiration, tenderness of the spinal accessory nerves, due to luxation of the vertebræ, especially dorsal or cervical vertebræ, loss in weight, constipation, dysmenorrhæa, amenorrhæa, anemia, dullness of the eyes, and other well known symptoms. In the third stage bacilli are found, with slight or occasional night sweats, pronounced dullness, râles, abnormal temperature, expectoration in the morning, occasional surface ulcerations, bone necrosis, meningitis (which can be detected only with the ozone electrode) and abdominal and pelvic tenderness. The fourth stage shows many displacements of the spinal vertebræ, sometimes curvature and extreme tenderness, meningitis, peritonitis, and cessation of the menses. This is the so-called hopeless condition, in which most patients die. In the fifth stage, all the recognized symptoms of the fourth stage are increased. Also there is frequently tuberculosis of the bowels, pus filled cavities in the lungs, liver, and kidneys, empyema, profuse night sweats, gangrene of the lungs, extreme emaciation, inability to take or retain food or water, respiration from 48 to 60 a minute, parts of the lungs not consolidated filled with râles, daily temperature up to 105° or 106°, pulse from 150 to 300, and death hourly expected.

All tuberculosis patients have one or more other diseases which complicate the case. The one thing that is persistently present is subluxation of the spinal column, which is not confined to tuberculosis but is found in most chronic diseases and is often the direct cause of the same. The cause is tertiary syphilis and is usually contracted through vaccination against smallpox, hence the white plague. But it is often inherited.

In my judgment a great error in treating tuberculosis is made in sending the patients to the country, where physical comforts and proper medical attention are often lacking. Most of such patients die, and few are even helped. In the early stages of the disease, woods or prairie life alone have been known to effect a cure in some cases, but home comforts and family associations are essentials that should not be lost sight of. All my patients, except a few in my early practice, were treated in this city, some of them leading a basement and sweatshop life and without a direct ray of sunlight, except when en route for treatment.

In all, I have treated more than seven hundred cases of tuberculosis, the majority of which were in the fourth or fifth stages. In only one, fifth stage case, could the patient have the care necessary for recovery, but after several years of persistent effort she resumed the care of her home. She never became robust, although able to resume social life, and later traveled across the continent. She lived fourteen years and died following apoplexy. Vaccination and a half inch displacement of the atlas of the spine were the direct causes of her trouble. The vertebra was so completely anchored in the false position that it resisted all efforts to replace it. The lower lobe of the left lung was finally destroyed by pus, which by surgical means was drawn off. Immediate and rapid relief followed with a drop of temperature from 105.5°, where it had been daily for months, to normal, where it remained. When this patient began treatment, only the extreme apex of the right lung appeared in action, respirations were never less than 48, temperature 103° to 106°, pulse 150 to 300, as near as could be calculated. With the exception of a number of cavities, some of which were large, all but the lower lobe of the left lung resumed a normal condition. The chest expansion which, after the tuberculous matter had been thrown off, was but one and a half inches, doubled under physical training in three months, and the shoulders widened three and a half inches.

Antisyphilitic treatment was employed in most of the cases, but in the first and second stages the patient will recover without it, providing they can have ozone treatment, or possibly out of door life in a dry atmosphere away from tuberculous patients, take regular pulmonary and general physical exercise, and observe the natural laws of health.

Patients in the second stage should have the acid treatment, avoid milk and eggs, tuberculous meats, and foodstuffs gathered from farms where tuberculosis has been detected, and take mild antisyphilitic drugs. The method of putting tuberculous patients to bed or confining them without an opportunity for physical exercise or outdoor life, is

strongly to be condemned. Tuberculous patients properly treated usually get well within four months on intravenous injections of salvarsan, one injection, followed by red iodide of mercury, one sixth to one fourth grain three times daily. Aqueous solution of iodine three times a day or more often as conditions indicate; ozone once to three times a day over the entire body, but especially the spine, lungs and head; substantial but palatable diet as soon as it can be tolerated, and in small quantities at a feeding; no creosote, codliver oil, and, so far as possible, no predigested foods should be given. If the temperature is high give whiskey sparingly. Wash out the stomach and rectum twice daily with a hot nonpoisonous disinfecting solution. All acid food and drink that is acceptable to the patient should be given. Acidulate the system rapidly and maintain this condition throughout the treatment. Administer from five to twenty drops of the clear acid mixture in a glass of water several times daily, preferably on an empty stomach.

Inhalations by atomizer, several times daily, of equal parts of lactic, acetic and aromatic sulphuric acids, one to four drams, sufficiently diluted, assist greatly in acidulating the blood, and in preventing hemorrhage. It also dissolves the mucus and pus, and kills tubercle bacilli and other bacteria which obstruct the breathing, and facilitates expectoration. Following the inhalations, expectoration becomes easy and free, and in a few days the tuberculous matter in the lungs is dissolved, and is coughed up in great quantities with ease. Pus cavities are emptied and gangrenous portions of the lungs thrown off. On two occasions I saw as much as half a pint of gangrenous lung tissue expelled at one time, along with a large quantity of pus.

Annoying conditions such as tooth trouble, eye-strain, and constipation or diarrhea, must have careful attention. When coughing is too exhausting, a very small dose of heroin may be injected. The calm that follows this administration affords rest, renews strength, and eventually produces sleep. The daily use of compound oxygen, especially in early stages and in hemorrhage, is of great value. As soon as the lungs are free, breathing exercises should be adopted to strengthen the long unused portion of the lungs, and permit of a greater amount of air being taken in.

Cracked wheat cooked three hours, eaten with syrup or with cream and sugar, bread from unrefined flour, butter, pure olive oil, vegetables and fruit that produce a minimum of gas, meat from healthy animals, and alfalfa nutrient are all excellent foods. The value of onions, asafetida, and garlic, cannot be estimated. I have made free use of them in all infectious diseases as they seem to have a decided influence on pathogenic conditions. If tuberculosis is rarely found among garlic eating people, it may be attributed to this vegetable. Plenty of pure water should be drunk always. The bodily temperature should be kept equable by hot and cold baths and proper clothing. Pleasant surroundings should be maintained and the patient encouraged to believe that recovery will be rapid. If there is a hemorrhagic tendency, give erigeron oil in small doses two or three times daily,

or turpentine or nutmeg, and inhale spray of the acid solution. From the first treatment by ozone, clinical signs of improvement are observed, and in six weeks, with daily or thrice daily ozonizations of the body, patients in the incipient stages apparently recover, while the consolidated lungs of those in the third stage are usually opened, the bacilli cleared, and the patient dismissed as cured in four months. Those in the fourth and fifth stages require a longer time, but ninety-four per cent. of the patients are usually well by the fourth month, while the remaining six per cent., provided every care can be given them, are free from all tuberculous symptoms in from six months to three years. The common practice of admitting patients in all stages of the disease under one roof, or a colony, is to be condemned.

Following twenty-two years of practical work and observation with tuberculous patients, I am satisfied that the tuberculous matter can be got rid of, and the patient rendered immune from the disease, provided that the treatment indicated by this etiology is properly administered.

This article was accepted in 1919 by the NEW YORK MEDICAL JOURNAL, but not published until now. In September, 1919, while in San Francisco I met Dr. Albert Abrams, and discussed with him the etiology of cancer. At that time he was unwilling to accept my findings as pointed out in an article published in the *Medical Record* of June, 1906, that syphilis is the cause of cancer.

During July, 1920, while visiting the laboratory of Dr. Abrams, he told me that since we had last met he had verified my contention that the etiology of cancer was syphilis, as he had found syphilis in all cases of cancer coming under his observation during the year. On this occasion I told him that the indirect etiology of tuberculosis was the same as that of cancer. This statement was also regarded dubiously. However, he was willing to be convinced, and immediately called to his laboratory several cases of tuberculosis then under treatment and applied his electronic reactions method for syphilis, finding it present in all of the cases. Therefore he accepted my theory.

In *Physico-Clinical Medicine* for June, 1921, appears an article by Dr. Abrams, on vaccination, in which he substantiates my claim that the vaccine ordinarily employed against smallpox contains syphilitic virus. All but three of many tests made of vaccine obtained from four laboratories contained congenital syphilis. He also reported the case of a boy whose blood showed no reaction of syphilis before vaccination but did show it nine weeks later.

I cite these findings of this eminent pathologist as further verification of my assertion that vaccine, as employed against smallpox, contains syphilis and is the primary cause of the white plague and that syphilis is the primary lesion that allows the development of tuberculosis. It is interesting to note that in all but two of the tests made, there was a reaction of streptococci and staphylococci and that there was a positive variolar reaction in all specimens.

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Editorial Articles

SOCIAL MISFITS

We were privileged (though the privilege was not a pleasant one) to visit recently a home and school for subnormal people, children and adults, where, from all over the world, were gathered all manner of specimens of human beings, or of beings in all stages on the way toward the human state. Helpless, immature animals many of them; fools some were once called, and these were of a kind once in demand for the entertainment of princes—by any name they may be called they are none the more pleasant to contemplate, though they are of all degrees of distressing appeal. The institution in question has done somewhat more than house and feed these unfortunates—it has been a leader in the study of its inmates with a view toward making the most of them, and, if possible, of discovering means of reducing the oncoming crop of such specimens, and of influencing public opinion to make larger and better economic provision for those children now in institutions who, later, may be cast upon a world for which they are unfit and in which they may do untold harm.

The five hundred inmates of this institution are gathered from the four corners of the earth, but that does not mean that one must search the antipodes to find such an array of unfortunates. If we may trust the figures of students, one community of fifty thousand persons can furnish as many subnormals, even if there be not the variety of cases found in this school. The number depends, of course, on the tests we apply in determining mentality, and the human mentality is a complex thing. The Binet scale with its various modifications is far from being a satisfactory measuring implement, but it is remarkably good and has served well for purposes of sorting. It is not a fine measure of social fitness nor of industrial capacity but for practical purposes a classification of this type is most important. In the Vineland school such tests are being worked out with a considerable measure of success.

The classification and appropriate training of the subnormal is of immense importance to society, for they do not improve with age. A recent survey of misfit adults in one of our states revealed the same one per cent. or so belonging to the group of the largely helpless but not harmless, of those needing direction and supervision in conduct for life. Fortunately, educators are waking up to the fact that the capacity for profiting by public school instruc-

tion is very limited in subnormal children and that efforts to carry them with the average child are wasted, while the normal child suffers from the drag of these unfortunates. Special schools are being established with special emphasis upon manual training.

From a strictly medical point of view the fate of these children after leaving school is of the greatest importance, since at least half the army of prostitutes is recruited from their ranks. Since even an appropriate education does not render them less dangerous from this viewpoint, the supervision of such persons beyond school age is of prime importance, though at present this is largely neglected by the state. And here, as in other human defects and diseases, prophylaxis comes first. Why should one or two out of a hundred of the population be moron, imbecile, idiot, or other menace to society? What defective breeding! And heredity tells at least half the tale.

THE DIFFERENTIAL DIAGNOSIS OF INVOLUNTARY MOVEMENTS IN NERVOUS AFFECTIONS¹

A fact not perhaps generally known, is that syringomyelia may give rise to involuntary movements at its onset. The diagnosis is difficult because it is the very commencement of the disease and at this time frequently the only symptom is that of involuntary movements, either in the form of tremor, jerks or choreiform movements. These disturbances may lead to the erroneous diagnosis of chorea, myoclonia or some other type of tremor, the diagnosis of syringomyelia not being considered.

The chorea of pregnancy is usually observed in young primiparæ and a history of chorea in the early life of the patient is not uncommon. The abnormal movements usually appear during the first half of pregnancy and the symptomatology is that of an ordinary Sydenham's chorea. However, the intensity of the phenomena is more marked and chorea of pregnancy is serious. There are almost invariably unquestionable evidences of an acute psychosis, with intellectual failure, restlessness and maniacal excitement. During labor the involuntary movements increase in intensity, but this type of chorea usually subsides after labor and finally disappears.

Chronic chorea is exceptional in adults. The motor syndrome is much the same as in Sydenham's chorea, but the movements are slower and usually

less extensive. Generally they begin in the face, then extend to the upper limbs and only become general little by little. The influence of the will is much greater and causes an arrest or a momentary diminution of the involuntary gesticulations when intentional movements are made. Very distinct mental disturbances likewise exist; a weakening of both intelligence and memory which may even reach dementia and almost complete intellectual decay, all of which may occur early in the process at the same time as the motor disorders and sometimes even before the latter. Sensory disturbances are usually absent in chronic chorea. Dubini's chorea is a pseudochorea, characterized by rapid, instantaneous jerks. The principal element in the clinical evolution of this affection is the intermittent convulsive paroxysms followed by hemiparetic manifestations, but not generalized from the onset. Usually there are at first some local monoplegic convulsions and then progressively—requiring several weeks only—the convulsive state becomes general, as well as the paretic condition. It would seem that there is the same diffusion of the disorder as in the epileptic convulsive states whose onset presents the Jacksonian type and which after several apoplectic attacks transforms into a generalized epilepsy. Unquestionably, this process is a chorea symptomatic of some cerebral lesion as yet not clear either as to its site or its nature. Bergeron's chorea occurs between the age of six and twelve years and is probably a manifestation of hysteria.

Under the heading of myoclonia, Vanlair includes a certain number of more or less permanent morbid states characterized by sudden, incoordinated contractions, rhythmical or arrhythmical, rapid in succession, aborted or followed by an effective displacement, always occurring in the same parts and resulting from the alternation between the action and relaxation of certain muscles, multiple paramyoclonus develops insidiously or more rarely suddenly, the convulsions being usually clonic, sudden, involuntary and without displacement excepting when the jerks are severe. These convulsions diminish when the patient stands, increase when he is lying down, but cease during sleep. The will also controls them to a marked degree. There is no motor incoordination, no amyotrophy or mechanical or electrical changes in the muscles. Neither are there any sensory, vasomotor, secretory or psychic disturbances.

Athetotic movements of the fingers, sometimes also of the toes, are involuntary movements occurring especially around the metacarpal and metatarsophalangeal joints, the fingers passing successively from flexion to extension and from abduction to

adduction with remarkable slowness and extent. This may be the only symptom present or it may be accompanied by various motor disturbances—chorea, spasms—which modify the symptomatic picture. Athetosis offers two distinct types; hemiathetosis and bilateral athetosis. Anesthesia and sensory disturbances are absent, but permanent intellectual disorders often occur which may reach the state of idiocy. Symptomatic tremors—toxic, hysteric or idiopathic, sclerosis *en plaques*—hardly resemble athetotic tremors which disturb the health and normal functions of the organs.

An intention tremor is a characteristic symptom of sclerosis *en plaques* and confusion with Parkinson's disease is not possible. The tremor of paralysis agitans is in reality a permanent one which tends to improve or disappear under the control of the will or during intentional movement. Mercurial tremor is also intentional but disappears with rest.

PHYSICIAN AUTHORS: JOHN KEATS.

This is the centenary year of the death of one of England's greatest poets—John Keats, who died of consumption in Rome on February 23, 1821, before he had reached the age of twenty-six and before he had attained the peak of possible development as a poet. The anniversary has occasioned many expressions of regret for what might have been had Keats lived out a normal span of life. Taking their cue from Tennyson, his greatest disciple, who repeatedly said that had Keats lived he might possibly have been the greatest English poet after Shakespeare, critics now are agreed that Keats gave every promise of ranking with Shakespeare, Homer and Dante. But though he was cut down at the beginning of his career, Keats was, as J. C. Squire points out, "a prodigy unparalleled for the volume of masterly early achievement." He left us the immortal *Odes* and such treasures as *St. Agnes Eve*, *Lamia*, *Isabella* and *Endymion*, and a tidy quantity of the loveliest lyrical poetry the world has ever seen. The estimate of Keats's poetry today is not what it was when he died, for his genius was not generally recognized until long after his death. His poems were unmercifully criticized by the reviewers of his day, particularly those of *Blackwood's Magazine* and the *Quarterly Review*. They advised the poet, when he abandoned the practice of medicine, to "stick to your ointments and plasters and pills" and *Blackwood's* noted his death briefly as that of "a young man who had left a decent calling for the melancholy trade of Cockney-poetry." Since that time, however, Keats's reputation has steadily grown. All critics are now ready to proclaim his greatness and

the small circle of admirers of a century ago now embraces everyone who has any love or appreciation of poetry.

Although Keats became a full-fledged surgeon, his heart never was in the work and the Muse soon won him for her very own. He was not temperamentally fitted for the practice of medicine and surgery. His biographers tell us he never was able to concentrate on his surgical work, and, indeed, we have it direct from Keats himself that his mind was likely to wander, even while he was performing operations. "My last operation," he once told Charles Armitage Brown, who accompanied him on a walking tour of Scotland, "was the opening of a man's temporal artery. I did it with the utmost nicety, but, reflecting on what passed through my mind at the time, my dexterity seemed a miracle, and I never took up the lancet again." His desertion of the profession at least showed a scrupulous sense of responsibility to his patients. The trouble seems to have been that Keats was forced into the profession at too early an age, without being consulted in the matter, or at least before he was prepared to make an intelligent decision as to what lifework he wanted to pursue. He was only fifteen when his guardian (both his parents were then dead) bound him as an apprentice for five years to Dr. Thomas Hammond, a surgeon at Edmonton.

Even before that time, however, his passion for literature had been awakened and whenever he could spare time from his work he plunged into reading and translating. A translation of the *Æneid* was one of his achievements during this period. Once a week or oftener he used to walk to the village of Enfield, where the family had resided up to the time of the death of his mother a few months before, to visit his friend, Charles Cowden Clarke, the son of his former teacher. Cowden Clarke fed his hunger for literature, by discussing books with him and lending him volumes to read. One of these was Spenser's *Fairie Queene*, which had such stimulating effect on his imagination that he set himself to imitate it and was delighted to find that he could do so with success. Keats's first poem was his *Imitation of Spenser*. His genius thus awakened, Keats continued to compose poetry and the responsibilities of surgery became a secondary matter in his thoughts.

His biographers are silent as to why Keats did not finish out his apprenticeship with Dr. Hammond, but no doubt his absorption in poetry had more to do with it than anything else. It is likely Dr. Hammond lost his temper because of Keats's indifference to the tasks set before him, and so, along toward the end of the fourth year, they parted company,

with the surgeon making no effort to hold Keats to his indenture. It may be assumed that this parting was preceded by a more or less heated controversy, for Keats mentions in a letter that he "shook his fist at old Hammond." But Keats was not yet ready to abandon surgery; he was not yet sure of himself as a poet. What little he had written had not been shown to anyone, not even to his friend Clarke. He had learned much during his apprenticeship and wanted to learn more, and so went to London to continue his studies in the surgical school operated jointly by St. Thomas's and Guy's Hospitals. In London, through Clarke, he met Leigh Hunt, Shelley, and other literary lights and his poetical ambitions were further stimulated. "He gave way gradually to his growing passion for poetry," we are told, and gained a reputation among fellow students as "a cheerful, crochety rhymster," much given to writing verses in his friends' notebooks. Despite this his student notebooks show that he was not lax or inaccurate as a student, says Sir Sidney Colvin in his *Life of Keats*. The only signs of a wandering mind occur on the margins of one or two pages that contain drawings of flowers. But the lecture notes themselves are full and close and indicate that he listened with an accurate and attentive mind:

"Poetry had become his chief interest," says Colvin, "but it is clear, at the same time, that he attended the hospitals and did his work regularly, acquiring a fairly solid knowledge, both theoretical and practical, of the rudiments of the medical and surgical science, so that he always afterwards was able to speak on such subjects with a certain mastery. On July 26, 1815, he passed with ease and credit his examination as a licentiate at Apothecaries Hall, and was appointed a dresser at Guy's Hospital on March 3, 1816, and the operations he performed or assisted in are said to have proved him no bungler. But his heart was not in the work. He could not find in the scientific part of it a satisfactory occupation for his thoughts; he knew nothing of that passion of philosophical curiosity in the mechanism and mysteries of the human frame which by turns attracted Coleridge and Shelley to the study of medicine. The practical responsibilities of the profession at the same time weighed upon him and he was conscious of a kind of absent, easy wonder at his own skill. Voices and visions he could not resist were luring his spirit along other paths, and once when Cowden Clarke asked him about his prospects and feelings in regard to his profession he frankly declared his own sense of his unfitness for it, with reasons such as this: 'The other day, during the lecture, there came a sunbeam into the room, and

with it a whole troop of creatures floating in the ray; and I was off with them to Oberon and fairyland.'"

Keats definitely abandoned surgery in the winter of 1816-17, and his first volume, *Poems by John Keats*, appeared the following spring. But though he hated the idea of practice, evidently he did not feel himself unqualified for it so far as knowledge was concerned. It is said he was always ready to speak or act with authority in cases of illness or emergency.

OCULAR TUBERCULIDES

Tschoumakova in his work on attenuated tuberculosis of the eye, concludes by saying that these processes offer characteristic signs of Dor's tuberculides. The ocular tuberculides comprise phlyctenular keratitis, parenchymatous keratitis and iritis of a tuberculous nature. It should be recalled that they are encountered in tuberculous subjects, those with bacillary antecedents, or in patients who do not appear to have Koch's bacilli by guineapig inoculation, but give a positive tuberculin reaction fairly constantly. Affecting the disseminated eruptive type, they are benign, with a tendency to spontaneous recovery and appear in crops. For Dor, of Lyons, subjects offering these processes react to tuberculin; their sera gives Arloing and Courmont's reaction—agglutination of cultures of tubercle bacilli at 1:10—and when injected subcutaneously into the guineapig causes a rise in temperature. Tuberculides are not admitted by all observers and various theories explaining the mechanism of the bacillary infection have given rise to prolonged discussion. There are two principal theories to be considered, the oldest being the toxic theory of Hallopeau and, later, Boeck.

Wishing to explain the creating of nonspecific lesions without typical tubercles, soluble tuberculous toxins, elaborated in some small distant focus, either visceral or lymphatic, have been involved. Brought by the blood, these toxins are supposed to irritate the tissues directly or by the intermediary of the trophic nerves. Hence, absence of bacilli and specific pathological lesions, the torpor of the process and its indefinite duration or frequent recurrences, the bacillary focus continuing to elaborate new outputs of toxins. But Koch's bacillus possesses other toxins than the diffusible ones and Auclair's researches have shown that they act especially by the adherent toxins—etherobacillin or chloroformobacillin, nondiffusible poisons which necessitate the presence of the bacillus at the site of the lesion.

The second theory—that of Haury and Darier—is based upon the presence of Koch's bacillus in

certain lesions and positive inoculations, however extremely rare. The local action of the bacilli has given rise to three hypotheses: bacilli belonging to special strains, dead or attenuated bacilli, and rare virulent bacilli.

The theory of special strains of bacilli maintained by Hallopeau in the case of erythematous lupus, supposes mildly virulent attenuated strains and is based upon the special clinical evolution of these atypical tubercloses. As a reason, those supporting this theory state that it is difficult to conceive that ordinary bacilli can create lesions differing so greatly from typical follicular lesions. But patients presenting ocular lesions included among tuberculides usually offer other foci of visceral tuberculosis created by the ordinary bacillus and it seems strange that a patient should be infected by several strains of bacilli at the same time. Consequently the two following theories seem more likely.

The theory of very attenuated or dead bacilli due to Haury, and later adopted by Darier and Jadassohn, asserts that the tuberculides are the result of emboli composed of bacilli very attenuated and extremely low in virulence, coming to the skin by the blood, which promptly die in the struggle against the phagocytic or bactericidal reaction of the invaded tissues. The bacilli reach the skin still capable of setting up a temporary local reaction or even small foci of necrosis, but they die or disappear rather quickly, hence spontaneous cure or non-inoculability of the lesions. The tuberculides are consequently cutaneous tubercloses originating in the blood. This theory based on the benignity of tuberculides explains the rarity of the bacilli in them and their accidental presence, as well as the inconstancy of positive inoculations.

The third theory, due to Gougerot, is that of rare but virulent bacilli. These come from some visceral or lymphatic focus and reaching the skin are immediately surrounded by a defensive reaction. The tissue reaction may be intense precisely because the bacilli are sufficiently virulent to set up a sharp cell proliferation and an afflux of leucocytes, but this nodular reaction is not follicular because the bacilli are few and being isolated their toxic action is not sufficient to create a tubercle. If a biopsy is done at this time, a rare bacillus may be found in the stained sections but only exceptionally. On account of this sharp cutaneous reaction the bacilli cannot multiply—they remain isolated.

The phagocytosis soon attenuates and destroys them. They remain living for a certain time and die at the end of the defensive tissue reaction. A biopsy at this time reveals no bacilli in the sections and guineapig inoculation is negative. The bacilli

once destroyed and absorbed, the lesion heals spontaneously.

In favor of the rarity of bacilli, the extreme difficulty of staining them in the sections may be mentioned and the impossibility of detecting them in the sections although occasionally a positive inoculation may be obtained. The small number of bacilli certainly plays the most important part but slow toxic impregnation of the organism unquestionably has an influence, while the nature of the soil is of highest import. Diminution of organic resistance has an unfavorable action in the development of tuberculides, while the contrary is true in favoring their development. And Gougerot insists on the resistant soil slowly intoxicated and tuberculinized as being one of the most powerful factors in the development of tuberculides with rare virulent bacilli. Undoubtedly, this theory seems more seductive and likely than the others, but the question is not yet solved, so that it is still uncertain whether phlyctenular keratitis can be regarded as a tuberculide. All that can be said for the present is the frequency of this lesion in tuberculous subjects.

MENTAL AGE OF ADULTS.

The increasing use of group intelligence tests should reduce the adult vanity to zero if it is carried far enough. Several years ago the average mental age of adults was said by psychologists to be sixteen years. Now comes a writer in the *Journal of Applied Psychology* and declares that it is only thirteen years. Not only that, but he declares that "the growth of general intelligence is found to be practically complete on the average by thirteen years of age, and is not on the average thereafter exceeded." This, he adds, applies strictly to the level of intelligence or degree of brightness, and not to "intelligence plus maturity, experience and acquisitions." His conclusions are based on the application of group intelligence tests to about 1,500,000 soldiers, 500 school children, 500 delinquent boys, and 250 feebleminded individuals.

News Items.

Philippine Government Studies New York Health Methods.—Dr. Juan Fernando, of the Philippine Health Service, during the last six months, has made an intensive study of the methods in use in the New York State Department of Health.

Director of Tuberculosis Division Resigns.—Dr. Malcolm F. Lent, director of the division of tuberculosis of the New York State Department of Health, tendered his resignation, which became effective on July 1st, in order to practise his specialty at Saranac Lake, N. Y. Dr. Lent was formerly superintendent of Stony Wold Tuberculosis Sanatorium at Lake Kushaqua, N. Y.

A Bust of Morton for the Hall of Fame.—At the annual dinner of the American Anesthetists held in Boston during A. M. A. week, Dr. S. Adolphus Knopf said it would be a proud privilege for the Associated Anesthetists to place a bronze bust of Morton in the niche assigned him by the electors to the Hall of Fame. This is to be done on October 16th.

1,900,000 Tuberculosis Invalids in France.—Dr. Baillon, laureate of the Faculty of Medicine of Paris, has come to America to reveal how serious the tuberculosis peril is in France. He is president of the Franco-American Committee of Fight Against Tuberculosis and is seeking members. Dr. Baillon says there are 1,900,000 cases of tuberculosis in France and not more than 10,000 beds available for the invalids. The number of deaths has reached 20,000 a year.

Scientific Temperance Federation Library.—A valuable library service of scientific works and references dealing with alcohol, owned by the Scientific Temperance Federation of Boston, is open to students and physicians. At the annual meeting of the Federation held June 23rd, a number of prominent men were elected as officers. Among the honorary vice-presidents are Dr. Richard C. Cabot, Dr. Haven Emerson, Dr. W. A. Evans, and Dr. Harvey W. Wiley.

\$35,000 to New York University.—The Rockefeller Foundation announces a contribution of \$35,000 to New York University to provide a clinic in the new building which the university is erecting adjacent to the university and to Bellevue Hospital Medical College. The gift supplements a contribution made last year by the General Education Board to the endowment fund of \$350,000. The new building will house a branch laboratory of the New York State Department of Health.

State Health Department Uses Social Hygiene Field Car.—The Venereal Disease Division of the New York State Health Department has secured the use of the social hygiene field car. It will be sent to counties where the home bureau agent makes a request for its use and agrees to arrange in advance for at least one lecture for men each day it is in the county. Lecturers will be furnished by the division. Ten counties have already requested the use of the car.

Public Health Institute Postponed.—The proposed Public Health institute which the United States Public Health Service contemplated holding in Washington, D. C., during the fall of 1921, has been indefinitely postponed. This action has been decided upon after several conferences between officers of the Service and officers of the American Public Health Association. The fiftieth annual meeting of the American Public Health Association is to be held in New York, November 14 to 18, 1921. Several other activities are planned by the association in connection with their semicentennial meeting, and it is at the request of the American Public Health Association that the service institute for next fall has been abandoned. The Service hopes that it will be possible to arrange to hold a similar institute in Washington during the spring or fall of 1922.

Cholera Spreading in European Russia.—Asiatic cholera is spreading rapidly in the whole of European Russia. There were six thousand cases reported up to June 25th. Petrograd and Moscow have become infected and the disease is spreading quickly and being propagated by the unusually hot weather.

Cancer Days in Pennsylvania.—Dr. William Pomp Walker, of Bethlehem, arranged for a cancer day for Northampton and Leigh counties on Friday, May 20th. A committee of arrangements was appointed, made up of the medical societies of these two counties, the Lehigh Valley Homeopathic Medical Society and the Pennsylvania Eclectic Medical Society. Harrisburg is planning a cancer day for September 6th.

American Gynecological Society.—At the annual meeting of the American Gynecological Society held at Swampscott, Mass., June 2d, 3d, and 4th, under the presidency of Dr. W. W. Chipman, of Montreal, the following officers were elected for the ensuing year: President, Dr. George Gray Ward, Jr., of New York; first vice-president, Dr. Barton Cooke Hirst, of Philadelphia; second vice-president, Dr. Walter P. Manton, of Detroit; secretary, Dr. Arthur H. Curtis, of Chicago; treasurer, Dr. Brooke M. Anspach, of Philadelphia. Other members of the council are Dr. Walter W. Chipman, of Montreal; Dr. Dougal Bissell, of New York; Dr. Fred L. Adair, of Minneapolis. The next meeting of the society will be held at Washington, D. C., on May 1, 2 and 3, 1922.

Personal.—Dr. G. Canby Robinson has been appointed to succeed temporarily Dr. William S. Thayer as professor of medicine at the Johns Hopkins Medical School and physician in chief of the Johns Hopkins Hospital.

Dr. Calvin H. Goddard has been appointed second assistant to the director of Johns Hopkins Hospital, succeeding Dr. A. J. Lomas.

Dr. Livingston Farrand, chairman of the central committee of the American Red Cross, formerly professor of anthropology at Columbia and former president of the University of Colorado, has been elected president of Cornell University.

Dr. John J. Erwin has been appointed superintendent of Mercy Hospital, Baltimore, taking charge of the hospital on July 1st.

Dr. Lee K. Frankel, vice-president of the Metropolitan Life Insurance Company of New York, has assumed personal charge of the welfare bureau set up in the Post Office Department to improve the working conditions of the 300,000 men and women postal workers.

Dr. Alexis Carrel has been elected a national associate of the Academy of Medicine of Paris. Under the rules of the academy, there may be only twenty national associates, all of whom have heretofore been residents of France.

Dr. Thomas W. Salmon has been appointed professor of psychiatry at the College of Physicians and Surgeons and has resigned from the staff of the Rockefeller Foundation. Both appointment and resignation took effect on July 1st. Dr. Salmon will continue to serve as the medical director of the National Committee for Mental Hygiene.

Died.

ABBOTT.—In Chicago, Ill., on Monday, July 4th, Dr. Wallace Calvin Abbott, aged sixty-three years.

BECHTOLD.—In Belleville, Ill., on Friday, June 17th, Dr. Louis J. Bechtold, aged seventy-three years.

BURR.—In Williamson, N. Y., on Sunday, June 12th, Dr. Henry Newton Burr, aged eighty-three years.

BUTLER.—In Buffalo, N. Y., on Wednesday, June 22nd, Dr. George Frank Butler, of Wilmette, Ill., aged sixty-four years.

DICKIE.—In Bremen, Ga., on Sunday, June 26th, Dr. James R. Dickie, aged thirty-six years.

DUNBAR.—In Manchester, N. H., on Sunday, June 19th, Dr. Eugene B. Dunbar, aged sixty-three years.

EARLE.—In Greenville, S. C., on Wednesday, June 29th, Dr. Thomas T. Earle, aged seventy-six years.

ELY.—In Ainsworth, Neb., on Thursday, June 23rd, Dr. William B. Ely, aged seventy-nine years.

FIELD.—In Elroy, Wis., on Wednesday, June 22nd, Dr. Ferdinand T. Field, aged sixty-nine years.

FINCH.—In New York, on Tuesday, June 21st, Dr. Sarah E. Finch, of Sound Beach, Conn., aged thirty-nine years.

GORDON.—In Portland, Me., on Wednesday, June 22nd, Dr. Seth C. Gordon, aged ninety-one.

GUY.—In Greenc, N. Y., on Tuesday, June 21st, Dr. Clement North Guy, aged eighty-one years.

HARTWELL.—In Philadelphia, Pa., on Tuesday, June 21st, Dr. John Henry Hartwell, aged forty-eight years.

HEALY.—In Denver, Col., on Friday, June 24th, Dr. Michael D. Healy, aged forty years.

HUNT.—In Little Falls, N. Y., on Saturday, June 25th, Dr. Ward E. Hunt, aged fifty-one years.

INGERSOLL.—In Canandaigua, N. Y., on Sunday, July 3rd, Dr. Joel M. Ingersoll, aged sixty-four years.

JENKINS.—In New York, on Saturday, June 25th, Dr. William T. Jenkins, aged sixty-five years.

JOHNSON.—In Toronto, Canada, on Thursday, June 9th, Dr. Arthur Jukes Johnson, aged seventy-two years.

JOHNSON.—In Assumption, Ill., on Friday, June 10th, Dr. Robert Wesley Johnson, aged seventy-two years.

KALISH.—In New York, on Monday, June 20th, Dr. Richard Kalish, aged sixty-seven years.

LACIAR.—In Bethlehem, Pa., on Monday, June 13th, Dr. Henry J. Laciari, aged sixty-three years.

LAIRD.—In Haverstraw, N. Y., on Friday, June 24th, Dr. Eugene B. Laird, aged sixty-four years.

MOON.—In Cooperstown, N. Y., on Tuesday, June 28th, Dr. John Henry Moon, aged seventy-two years.

NIGHTINGALE.—In Philadelphia, Pa., on Thursday, June 23rd, Dr. Henry B. Nightingale, aged sixty-six years.

OLIVER.—In Chula Vista, Cal., on Friday, June 10th, Dr. Leonard Briggs Oliver, aged sixty-three years.

PARRY.—In Waynesburg, Pa., on Saturday, June 25th, Dr. William M. Parry, aged seventy-eight years.

POTTER.—In Rochester, N. Y., on Friday, July 1st, Dr. Ezra B. Potter, aged seventy-two years.

ROSE.—In Albany, N. Y., on Wednesday, June 22nd, Dr. Edgar M. Rose, of New York, aged thirty-seven years.

SLIGH.—In Long Beach, Cal., on Wednesday, June 8th, Dr. James Sligh, of Montana, aged seventy-six years.

STALLMAN.—In Irondequoit Bay, N. Y., on Thursday, June 30th, Dr. George B. Stallman, of Camp Dix, N. J., aged forty-four years.

STATON.—In Tarboro, N. C., on Saturday, July 2nd, Dr. Lycurgus L. Staton, aged seventy-two years.

THOMAS.—In Philadelphia, Pa., on Tuesday, June 28th, Dr. Charles Hermon Thomas, aged eighty-two years.

TOWNE.—In Lake Champlain, N. Y., on Saturday, June 18th, Dr. Everett S. Towne, of Burlington, Vt., aged thirty-six years.

VANDERSLICE.—In Philadelphia, Pa., on Tuesday, June 28th, Dr. Edward S. Vanderslice, aged seventy-seven years.

WARD.—In Cohoes, N. Y., on Saturday, June 25th, Dr. Bela J. Ward, aged sixty-three years.

WINCHELL.—In Brooklyn, N. Y., on Saturday, June 18th, Dr. Walter Bernard Winchell, aged sixty-three years.

LONDON LETTER

*(From our own correspondent.)**Obstetrical and Gynecological Unit of the Royal Free Hospital, London—X Ray Dangers—Conference on National Health—Dangers of Radium—Professional Secrecy—Infection with Syphilis from the Mother—Obituary.*

LONDON, May 30, 1921.

Care and treatment of the sick and injured has existed in all ages. In the early centuries of Christian civilization hospitals were founded and were wholly in the hands of the religious orders. In those days monks and nuns, especially those of certain orders, were well versed in the application of simples, they had a somewhat elementary knowledge of drugs and pharmacology, and knew how to bind up wounds. It was not until the reign of Edward VI that the charter of the Barber Surgeons was granted in England (1461). The first medical registration act followed in 1511 and the Royal College of Physicians was founded, in the reign of Henry VIII in 1518. Since that time medical knowledge and education in Great Britain has gone forward fitfully but the passing of the Medical Act of 1858 marks a distinct step in the progress of modern medicine and teaching.

Medical education in Great Britain was carried on for many years under a system of apprenticeship which had developed from the day when young men were apprenticed to physicians and surgeons who had made a name for themselves either in hospital work or private practice. This system was developed or changed later on into that system now known when all medical students become clerks and dressers to the members of the hospital staff and are taught their clinical work in the wards of a general hospital recognized by the general medical council (a general hospital being a hospital where men, women and children are treated). The physicians and surgeons on the staffs of these general hospitals (there are twelve in London) were usually those who had shown themselves to be excellent clinicians and surgeons, and part of their duties, a very important part, was the teaching and training of the medical students. In many cases the physicians and surgeons were thoroughly able teachers and in some cases did much good and original work in research. It can, however, be readily understood that a capable physician or surgeon had many calls on his time for private work and that also that being a good physician or surgeon did not necessarily mean that he was a good teacher. Moreover, the work in medicine and surgery has become more and more specialized as time went on and pathology now occupies a large place in the education of all medical students.

In 1913 the idea of "units" for the teaching of medicine, surgery, obstetrics and gynecology was first brought forward in Great Britain in the Haldane Commission on University teaching, but owing to the war the development of teaching on these lines was held in abeyance for some years. The underlying plan of a unit, or team work, is that a director and two or more assistants should have a certain numbers of beds, sixty to one hundred, under their control, and that they should devote the whole of their time to the care of these patients,

the teaching of students and to research, the directors to be chosen for their known good work, their powers of imparting their knowledge to the students, and their interest in and capacity for research; and the assistants to be selected for the promise of developments along these lines they had exhibited since their qualification. Up to the present time only five of the twelve great teaching hospitals of London, to wit, St. Bartholomew, London, University College Hospital, St. Thomas's and the Royal Free Hospitals, have been recognized by the University Grants' Committee as eligible for the conduct of units and to which directors of units have been appointed by the Senate of the University of London. In the first four hospitals in this list units of medicine and surgery have been organized.

To the Royal Free Hospital has been accorded the honor of being the first hospital to be permitted to conduct a unit of obstetrics and gynecology. Hitherto the work in general hospitals in connection with obstetrics and gynecology has been under the care of various physicians, obstetricians and gynecologists, i. e., the antenatal work, the obstetric department of the hospital and in the district surrounding the hospital, the baby consultations and infant welfare department, the outpatients' department and wards for the diseases of women, and the department for venereal disease. This work is now coordinated in the unit of obstetrics and gynecology under the Director, Professor A. Louise McLroy, and her assistants who will follow the cases from the time they first come under observation and in this way a more thorough view of the history of disease will be obtained and the students will be enabled to observe and study the early stages of disease and its subsequent developments instead of coming across the case at different stages in different departments.

This system of unit teaching is in its infancy and the University Grants' Committee have provided in the first instance that it shall continue for a term of five years when it will be examined carefully in order to judge whether it has succeeded sufficiently to warrant its continuance. This system of education is necessarily very expensive, since the director and assistants are debarred from private practice, and could not be carried out without grants from the treasury supplemented by payments from the medical school, but if, as it is confidently believed, it will result in a much more comprehensive and vivid view of disease and lead to improved methods of prevention and treatment, it will be well worth the money expended upon it.

The Obstetrical and Gynecological Unit of the Royal Free Hospital School of Medicine for Women, University of London, has its headquarters at the Royal Free Hospital, Gray's Inn Road, London, E. C. It occupies the top floor of the new wing of the hospital building and consists of an obstetrical ward of twelve beds, with smaller wards for labor and isolation, etc.; adjoining it are three wards of twenty-six beds in all for gynecological cases with operating theatre, anesthetic and preparation rooms attached. At the further end of the wing is the teaching department, consisting of

an examination room for patients and demonstrations for students, a professor's room, assistant's clinical laboratory with secretary's room where inquiries are made as to the work of the department. A cloak room for the staff, and a suite of rooms for the residential obstetric surgeon completes the accommodation. Lectures are given to the students in the main lecture room downstairs. There is a branch of this hospital which is under the director of the unit and which accommodates twenty-six obstetric beds, a few venereal obstetrical cases being included. This hospital was given by the Duchess of Marlborough, nee Vanderbilt, and is situated in Endsleigh Street close by the main building. It is composed of small wards daintily furnished and is run on the lines of a nursing home. The patients in this department pay for their maintenance in hospital according to accommodation. It has labor wards, isolation, etc. The department at the Royal Free Hospital is being equipped for research work upon antenatal pathology and also upon the physiological processes connected with childbirth and pregnancy. Special researches will be made upon the economic questions in women's work, upon the influence of such upon the child, the influences of venereal and other toxic diseases in pregnancy.

An account of the Obstetrical and Gynecological Unit at the Royal Free Hospital would be incomplete without a sketch of the recently appointed director of this unit. Dr. A. Louise McIlroy is a distinguished graduate of Glasgow University, and has held important medical posts in the city of her birth. Almost at the outbreak of the war Dr. McIlroy volunteered for active service and joined the Scottish Medical Women's Contingent under the leadership of Dr. Elsie Inglis. While serving on all the fronts, with the exception of the Italian, by far the greater part of her work was done in the near Eastern theatre of war. At one time Dr. McIlroy was surgeon in charge of the British Hospital in Salonika, and when there she sent an extremely interesting paper which was published in the special war number of *American Medicine*, issued some two or three years ago. For some time before the end of the war and for a period after its close, Dr. McIlroy was the head of an obstetrical and gynecological hospital in Constantinople where she acquired a good deal of experience in the idiosyncrasies, if the term is applicable, of Eastern women in labor. Some of these experiences and her methods of treatment she related two months or so ago before the Obstetrical and Gynecological Section of the Royal Society of Medicine, London. Dr. Louise McIlroy was appointed recently in open competition director of the Obstetrical and Gynecological Unit at the Royal Free Hospital. A better choice could not have been made as Dr. McIlroy, in addition to her mental gifts and comprehensive and accurate knowledge of her special subject, is an excellent organizer, and despite the fact that the rôle of prophet is a thankless one, I venture to predict that not only will good work be done at the new Unit but that the original research there will result in discoveries that will immensely improve the practice of obstetrics. It is well known that at

the present time, this branch of surgery, especially in this country, is in a backward condition. There is room for great improvement and the establishment of the Unit under the direction of Dr. McIlroy is an obvious step in the right direction.

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The death of Dr. Ironside Bruce, the radiologist to Charing Cross Hospital, presumably from the effects of constantly operating x rays, has again directed attention to the danger to which all are exposed who treat disease by x rays and radium. But the case of Dr. Bruce differs from that of the earlier operators of this form of treatment. The dangers then were chiefly those which were due to the overexposure of the skin of the operator to the radiations. The damage thus wrought frequently developed into malignant growths. The risk of such occurrences has been overcome to a large extent by the employment of appropriate protective measures. However, a new danger appears to have now exhibited itself since the use of more penetrating radiations. The result is, that in place of the ill effects being manifested on the surface, the deeper structures, particularly the blood forming cells, have been attacked. One of the manifestations is that form of anemia known as aplastic, to which condition Dr. Bruce fell a victim. This type of anemia appears to be intractable to treatment, leading to general weakness and in some cases to death. Still, it may be noted that anemia of this kind occurs also in those who have never been exposed to radiations. As for the precise manner in which aplastic anemia is brought about opinions vary. Although it has been proved in some cases to be due to the radiations themselves, the view is held that the production of nitrous acid in the air by the electric discharges may be a predisposing factor, one point is quite clear, namely that vitiated air brings about that state of fatigue, well known to x ray workers, especially in restricted spaces. The necessity for well ventilated departments is therefore patent.

Up to the present time it has not been possible to gauge what is a minimum safe dose to which operators may submit themselves, but researches in this direction now going on inspire the hope that this difficulty is not insurmountable. The danger to operators is a hidden one, as the collection of radium emanations by means of the somewhat complex apparatus now in use has a danger of its own. As a rule, no special sensation is produced by these radiations. Consequently, the danger is all the greater because it is almost completely hidden. The whole subject requires careful and systematic investigation. This much is plainly obvious, that the rapid development of the technic has rendered those protective measures already devised more or less obsolete, at any rate, they are not completely effective. Therefore, as said before, very extensive research is required in all branches of radiation work, and on the technical side, in particular. An Institute of Radiology has been suggested for this and there is no doubt whatever that it is greatly needed.

Radiologists here have been much handicapped by the absence of means for research on organized

and comprehensive lines. It is encouraging to learn that in order to meet this pressing need an effort is being made to obtain funds for an Institute of Radiology as a memorial to the late Sir James Mackenzie Davidson, a great pioneer of the science. While, of course, such an institute should be thoroughly equipped from the physical, biological and technical side, it may again be emphasized, that, owing to trade conditions, it is from the technical viewpoint that Great Britain has been more handicapped than any other country. The large electrical corporations in America and Germany have fostered the development of applied science and thus have been able to bring out new apparatus and technic.

According to an article contributed to the *Observer*, April 3, 1921, as a preliminary measure to the establishment of an Institute of Radiology, a committee of experts is being formed for the purpose of investigating methods of protection. But, as the writer of the article in question goes on to say, "The outcome of the work of this committee will be awaited with great interest; to be, however, of real use, any authoritative recommendations which may be made must be followed up by equally authoritative action." This advice is useful and to the point, as it appears to be becoming somewhat of a habit here for committees to be formed who spend a good deal of valuable time and money in investigation, write out a good and voluminous report and then the matter is shelved indefinitely. The subject of radiation is important and serious. Recently, much progress in this form of treating certain diseases has been made and its possibilities from the therapeutic point of view seem to be almost illimitable. No effort should be spared not only to render the x ray and radium treatment more and more effective but safe to the operator. It has been shown to be safe so far as the patient is concerned, but until it has been made safe for the operator also, such treatment cannot be deemed really effective. There is little doubt that carefully conducted investigations done under favorable conditions would result in the evolution and development of measures which would safeguard the operator. An Institute of Radiology would provide the means for carrying out researches under the best possible conditions, and it is to be hoped that an institute of this kind will be founded in Great Britain in a reasonably short space of time.

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A conference on national health was held on April 2, 1921, at the Central Hall, Westminster, London, under the auspices of the Faculty of Insurance, Ltd. Incidentally, it may be mentioned that Dr. Christopher Addison has retired from the post of minister of health, and that Sir Alfred Mond has been appointed in his place. Sir Kingsley Wood, M. P., speaking at the conference, said in part that the new minister of health had many qualities of eminence, notably that of being a keen administrator and a capable business man. He had been interested in health work in connection with hospital administration, and on the housing side of their work he would prove a capable and popular minister.

Reviewing some of the points of health administration, Sir Kingsley Wood remarked that during the last two years the financial situation had had a very serious effect upon national health plans. A matter which would have to be considered by every insurance worker in the future would be how far they could, under the present condition of affairs, hope to extend many of their services.

The trend of the deathrate in England and Wales was steadily downward, and the decline had taken place in all ages. Recently this improvement had extended to the middle years of life. During the first twenty years of the present century there had been a remarkable fall in the infant mortality rate. In no small measure the progress that had been made was undoubtedly due to the continual steps that were taken to combat disease and death. In 1919 forty-two per cent. of the total deaths took place under forty-five years of age, and this was surely a matter within human control. In England and Wales there were at least a million and a half people constantly on the sick list; over 13,000,000 weeks were lost in England on an average every year through sickness, and on that account the nation lost every year the equivalent of the work of 260,000 persons of the industrial classes alone. The death rate of women in childbirth remained approximately what it was twenty-five years ago, and 3,000 mothers were so lost every year, a mortality which was almost entirely preventable. Sixty thousand infants were lost every year. These were some of the vital problems which confronted the nation, and they were of exceptional difficulty, having regard to the state today of the financial resources of the country. Progress, commercial and otherwise, depended largely upon the nation's health. Nothing was so wasteful and extravagant as preventable unhealthy conditions; nothing was so economical as carefully expended money in avoiding them.

Few people realized that the great influenza scourge destroyed more human life in a few months than the European war in five years. In forty-six weeks, from June, 1918, to May, 1919, over 150,000 deaths were attributed to this disease alone in England and Wales. Who could count what the financial loss was to the community? While the Ministry of Health had now to look twice at every penny that was spent, he had no hesitation in saying that they must continue their work, at the same time having regard to the needs and difficulties of the time.

Sir Walter Kinnear, controller of national health insurance, who spoke on Valuations of Approved Societies, paid a high tribute to Dr. Addison, who, he said, had the entire confidence of the approved societies, and carried with him to his new appointment the regard of all who came into personal contact with him. Since the National Health Insurance Act was passed no less than £65,000,000 had been paid away in cash benefits, £53,000,000 had been spent in medical and sanatorium treatment, and £83,000,000 had been accumulated in invested funds. Now that the war clouds were lifting it was not unnatural to turn to the National Health Insurance Act and ask what the valuations of the

approved societies were revealing. The valuation results in respect of nearly 7,000 societies and branches, out of the total number of 10,300, had now been issued and showed an aggregate surplus over liabilities of about £6,500,000 and a disposal surplus of nearly £4,000,000. These figures related to 5,500,000 insured persons.

The completed valuation results indicated that only eight per cent. of the societies and branches had no disposable surplus, and only three cases had yet emerged in which resort would have to be made to the central fund. As to what the societies intended to do with this large surplus, Sir Walter Kinnear said that, in view of the high cost of living, no doubt the inclination would be to increase the cash benefits, but there was a growing feeling among approved societies that the prevention and eradication of disease was just as much their function as its palliation. As the maintenance of the voluntary system of hospital management is desirable in the public interest, it would be regrettable if the exigencies of the situation compelled the hospitals to close their doors to insured persons. Sir Walter Kinnear said he understood that a number of hospitals are prepared to accept members of approved societies on the payment of something like fifty per cent. of the actual cost, and, in his opinion, this was an offer which the societies ought carefully to consider. A weekly payment toward the cost of each individual member might be made, or a pooling system adopted, whereby in return for a quarterly or yearly subscription to a central body, hospital services reasonably commensurate with the amount of the subscription could be obtained.

Sir Thomas Neill, Consultative Council on Health Insurance Approved Societies, urged the claims of voluntary hospitals for support from approved societies, pointing out that to these hospitals all were indebted for the medical knowledge possessed. Of the patients treated a considerable proportion were members of societies, and, inasmuch as the hospitals cured these people of their ailments, they saved the societies large sums which otherwise would have to be paid in sickness benefit.

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At a meeting of the Section for the Study of Disease in Children of the Royal Society of Medicine, held in the building of the society on March 16, 1921, Mr. J. E. R. McDonagh said that if a woman contracted syphilis before the fifth month of pregnancy the child always contracted the disease; if she became syphilitic during the sixth and seventh months the child was affected by congenital syphilis in about half the cases, and, if during the eighth and ninth month, the child escaped.

* * *

The French Academy of Medicine has recently appointed a committee to frame a list of the measures of precaution to be employed to safeguard the use of radium. The decision followed the reading of a paper by Professor Bordier, of the University of Lyons, who declared that the dangers incurred by those manipulating radium are greater by far than those faced by x ray operators. The com-

mittee will include Doctors Bécélère, Delbet, Siredey, Broca, Quénu, and Martin.

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The Council of the Royal College of Surgeons in Ireland has passed the following resolution: "The Council is of the opinion that it is contrary to the public interest that medical men should break their professional tradition and, without the consent of the patient, disclose information which they have obtained in the discharge of their professional duties. If any instance is reported to the Council in which one of the Fellows or Licentiates of the College is pressed to break confidence, such specific case will be considered by the Council and representations made to the authorities if such be thought necessary."

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On Tuesday, March 29, 1921, a notable figure in the British medical world passed away. Reference is made to Dr. Robert Murray Leslie, 143 Harley Street, London, W., who died at the early age of fifty-four. Dr. Leslie was one of the most distinguished students who ever passed through the medical course at Edinburgh University. He took his degree of M. A. with the highest honors, B. Sc., M. B., M. Ch., first of the first class. When he obtained the degree of Bachelor of Science he was awarded the Sir Edward Baxter Scholarship as the most "eminent science graduate" of the year. He was awarded the Ettles Scholarship, which is given to the most distinguished medical graduate of the year, and also obtained the Stark Scholarship in Clinical Medicine. He was likewise awarded the premier University Medals in Practice of Physic and Obstetric Medicine. He held the post of House Physician at Edinburgh Royal Infirmary, and when he came to London was made House Physician at the Brompton Chest Hospital. In 1894 he was appointed Assistant Physician to the Royal Hospital for Diseases of the Chest, and after doing good work there for twenty-six years retired a few months ago, being then Senior Physician. He was also physician to the Prince of Wales's General Hospital at Tottenham, near London. Dr. Leslie was one of the founders of the North-East London Post-Graduate College, Tottenham, and of the North-East London Clinical Society. He was Fellow of several learned societies, and in July, 1896, was elected an officer of the French Academy.

Dr. Leslie was an exceptionally able man from all points of view. He was an excellent lecturer, presenting his subject in a clear and vivid manner, and as a writer, besides being logical and cogent, possessed literary charm and distinction. Among his writings may be mentioned the article on hemoptysis in the *Encyclopedia Medica*, 1900, and shortly before his death he had completed an important work on Pneumonia and Its Modern Treatment for the *Oxford Medical Press*. He contributed many papers to medical and scientific journals.

In private life Dr. Leslie was liked universally. He was of a kind disposition, and he spared neither time nor money to aid those he knew and liked. No man of the British medical profession will be more greatly mourned or more keenly missed than Robert Murray Leslie.

Book Reviews

THE AMERICAN SCHOOL OF PSYCHIATRY.

Foundations of Psychiatry. By WILLIAM A. WHITE, M. D.
With an Introduction by Dr. STEWART PATON. Nervous
and Mental Disease Monograph Series No. 32. New
York and Washington: Nervous and Mental Disease Pub-
lishing Company, 1921. Pp. ix-136.

Dr. White has presented this monograph as an exposition of features of the American School of Psychiatry. He has done more than this and he has done less; the viewpoint will depend largely upon the reader. The so-called psychiatrist who flamboyantly declares that any examination of the unconscious is pernicious, and when it is attempted in young people is "criminal," will deny that the American school is represented, for is not this physician an American and does he not call himself a psychiatrist? But he has not been overlooked in this valuable little book of Dr. White's; he has been properly tabulated in the evolutionary scale of the development of psychiatry. He is the physician who knows every symptom of the neurotic and given enough of these he knows the name of the patient's disease. He will attempt to say if the patient can be cured or whether the condition is hopeless. This type of psychiatrist is content with archaic psychiatry. He best expresses his attitude by saying "if it was intended that certain things be placed in the unconscious, what right have we to bring these things to light?" What right did we have to dissect bodies? What right have we to cure neurotics or psychopaths if it was intended that they function mentally in a different fashion?

Now there are others who will say the monograph does more than the author modestly states. First it presents with marked clarity many of the tenets set forth by the more progressive psychopathologists; many of which have not been realized by workers in psychopathology on account of the highly condensed form in which they have been presented. Many of the terms are used constantly by psychopathologists, terms which can not be avoided if common ground is to be held, are so simplified in this monograph that for the first time many workers will be able to get an understanding of them.

One of the most important things that has been done for the first time, is the binding together of the salient features which have been developed by the various workers in the American field. Dr. White has shown how, in order to meet an effective need

due to environmental situations, the American school has worked out a more pragmatic, a more basic psychopathology than that of their European coworkers. Much courage was required, for the fundamental concepts as set down by Freud were so far-reaching and so basic that they startled the workers who found his teachings to be truths and workable. But it can safely be said that while American workers have added much to the primary principles of Freud they have followed him more closely than have many European workers, who by their labors have added less to the practical value of analysis. So far the workers in the American school have not attempted to enter the realm of metaphysics as have some of the British workers, nor the realm of theology as has been attempted by some of the Swiss school.

It is stated that the war was one of the factors causing a demarcation in the trend of the development of the various schools. This may have hastened the process, but it was bound to come, for the needs were not the same. It may be stated that neuroses and psychoses are the same the world over. This is true, but the factors causing the various conditionings are not the same here. The obstacles encountered are not the same. The mechanisms of repression and regression are the same. The patient always goes back to infantile archaic levels when he encounters an obstacle which his ego does not face or fight. For this reason we have been able to build on the foundations of Freud and for this reason the European workers will be able to utilize the findings of their



WILLIAM A. WHITE, M. D.,
Author of *Foundations of Psychiatry*.

American colleagues which here have been outlined.

White has enumerated the features emphasized by the American school as follows: 1. The unity of the organism as an energy system; 2, human behavior as a special problem of energy transformation and discharge; 3, structural organization as an instance of the phyletic synthesis of experience, with the nervous system as the chief agent in this organization; 4, the principle of action patterns of discharge as integral parts of the structural organization; 5, the conception that the symbol is a source and carrier of energy; 6, the abolition of the metaphysical distinction between mind and body; 7, the conception of the unconscious as a container of the phyletic history of the organization of the psyche in action pattern symbolization; 8, the importance of archaic symbols and their relationship to somatic as well as mental diseases; 9, the belief that organic disorders have their psychological as well as their

somatic symptomatology; 10, the belief that standards of conduct are an integral part of the action pattern symbolization and therefore must be included in the understanding and management of all medical and social problems.

This is an excellent résumé of the situation. White takes up each of these subjects in turn and handles them with the same clarity as his initial classification. He takes the matter up in historical progression and traces the development of psychiatry step by step. No clearer exposé of the phylogenetic and ontogenetic archaic background of the genus *Homo* has come to the notice of the reviewer.

Many monographs of great value have been published in this series, but nevertheless this, the last one of the series, is one of the most helpful to the medical man interested in human behavior and its queer twists and turns. It is intensely stimulating to the worker in psychopathology who has long looked for a book of this character and it is of real, practical value to the medical man. It presents a sound psychology and a profound philosophy.

SEX AND LIFE.

Sex and Life. By W. F. ROBIE, M. D., Superintendent of Pine Terrace, Baldwinville, Mass. Boston: Richard G. Badger, 1920.

Dr. Robie's work is to be criticized in order to commend his purpose, for one would bid godspeed to any such honest furtherance of sex knowledge. Yet one would wish that he went further back in order to go more forward. Robie has a genuine interest in his fellow men and women. It is an interest that cannot withhold itself from setting forth their needs plainly and helping them to adjust themselves in the way that health and happiness demand. He has done this and proved the sincerity of his position in his practice and is unafraid to promote his service still further in his writing. He has taken into account the ever present pressure of sex and followed it into the details of its manifestations. He has freed the knowledge of these from the misapprehensions and therefore the fear and shame which have too long surrounded them. In none of these things has he gone deeply enough into the fundamental psychological principles underlying all sex pressure as well as the difficulties in the way of its manifestations. Nor has he considered the details of psychical experience which adhere to the underlying psychology and complicate the difficulties, intensifying and resistances, fears, and the desires against which these are defenses. Robie does need that more labored consideration of psychoanalysis over which he is inclined to pass somewhat impatiently. We like his enthusiasm, his genuineness, yet his book would have gained rather than lost by more thorough digestion of facts. His rather exuberant style, hastily struck off diction, after all do not so thoroughly drive the truth home for acceptance as a more carefully chosen presentation might have done. At the same time one realizes the contagious interest with which he reaches his readers. Of course there must be different forms of presentation to reach differently thinking types of men and women.

The deeper criticism lies in the lack of the more

profound background of understanding. Robie pays so much attention, and not without right, to the sex need in itself that he gives the impression of exalting it and its forms of gratification somewhat out of relationship to the whole personality, to the responsibility to one's other interests and those of the herd. Not that we believe this is the practical effect upon himself or perhaps upon many of those he helps. But his book reads to that effect and one could be swung into such an attitude by the neglect of those other personal factors which have to be taken into account. In fact there would be probably those upon whom his broad advice could not work helpfully because these other factors are not sufficiently taken cognizance of. He has stressed the undeniable importance of the sexual segment in the makeup of a human individual. He has forgotten the struggles with its segment that this same personality makes, that is, has forgotten it in the light of this marked double pull in the personality.

Freud has called it the conflict of the sexual libido with the ego libido. Stekel has aphorized it as the conflict of brain and spinal cord. This brings in so many other possibilities for libido activity and the effort to withdraw sex libido to them or the opposition of other aims to sex libido that the problem is hardly so simple as Robie states it. It does involve those infantile elements, those earlier preliminary manifestations of sex and of sex struggle which he tends to disregard and rather indifferently to relegate to the Freudians. These also present such an aspect of things that some of his measures might be subject to question. To have a mother present sex problems so affectionately to her son as in the model letter quoted suggests the need of that caution which the study of child sexuality has taught us.

There are many problems of affection involved upon which Robie touches barely or not at all but without which sex cannot be fully grasped by the individual or one who would help him.

GERMAN SURGERY.

Chirurgie der Wirbelsäule, des Rückenmarks, der Bauchdecken und des Beckens. By Geh. Med.-Rat Prof. Dr. G. LEDDERHOSE, Munich, Germany. With a Foreword by Prof. Dr. J. SCHWALBE, Berlin. With Twenty Illustrations. Leipzig: Georg Thieme, 1921.

This little monograph of 160 pages covers in detail the surgery of the vertebral column, the spinal cord, abdominal walls and pelvis, with particular reference to diagnostic and therapeutic errors and their prevention. It is characterized by the usual German thoroughness and attention to detail. This may be illustrated by the discussion of the diseases of the navel, under which the following subjects are discussed: Inflammation and the formation of concretions; tumorlike indurations; adenomatous and primary carcinomatous formations; enteroteratoma; fistula; fistula of the vitelline duct; urinary fistula; cyst of the urachus; acquired fecal fistula; fistula of the navel secondary to liver and gallbladder diseases; fistula of peritoneal origin and recurring navel colic in children. The German reading surgeon who is willing to forget and forgive will find this little volume of considerable interest.

AMERICAN REVIEW OF TUBERCULOSIS.

The American Review of Tuberculosis. Journal of the National Tuberculosis Association. April and May, 1921. EDWARD R. BALDWIN, Saranac Lake, N. Y., Editor in Chief; ALLEN K. KRAUSE, Baltimore, Md., Managing Editor.

These numbers of the very popular and thoroughly scientific *American Review of Tuberculosis* are of unusual interest. The April number contains four of the most remarkable contributions which have been made of late on the various phases of the tuberculosis problem. The first is Sunlight and Artificial Light Therapy in Tuberculosis by Edgar Mayer. This is a historical and critical review of solar therapy, the physiology of light reaction and the action of light upon bacteria, the artificial sources of light, particularly the Finsen lamp and the Alpine quartz lamp and its various modifications; lastly, the therapeutic application of sunlight and its contraindications in pulmonary tuberculosis. The author also refers to the encouraging results of x ray and radium radiation in intestinal tuberculosis. In his conclusions he admits that insufficient comparative and statistical studies upon patients, especially upon those with pulmonary disease, leave much to be desired. Those interested in the subject of solar and artificial light therapy might care to look over the thirteen pages of bibliography on the subject which the author has added to his seventy pages of critical review of heliotherapy and artificial light therapy.

The next article is on the subject of Heliotherapy in Surgical Tuberculosis—Report of Results After Six and a Half Years Use at the J. N. Adam Memorial Hospital, by Clarence L. Hyde and Horace Lo Grasso, Perrysburg, N. Y. A mere glance at the twenty-six illustrations showing the cases before and after treatment is sufficient to arouse enthusiasm in any medical man over this new and yet so old remedy. The results obtained by Perrysburg seem to equal those obtained by Rollier of Leysin in Switzerland.

The two concluding articles in this number of the *American Review of Tuberculosis* are The Cost of Tuberculosis by Louis I. Dublin, the well known statistician of the Metropolitan Life Insurance Company, and Miss Jessamine Whitney, of the National Tuberculosis Association, and The Reason and Remedy for Missing the Early Tuberculous Lesion by Henry F. Stoll. Both articles deserve a careful perusal by all students interested in the social and clinical aspects of tuberculosis.

The May number is also of unusual interest. It contains the following contributions: Studies on Tuberculous Infection—VIII, Spontaneous Pneumoconiosis in the Guinea pig, by Henry Stuart Willis; The Focal Reaction, by William F. Petersen; The Importance of Subliminal Symptoms and Period of Alternation of Rest and Exercise in the Treatment of Pulmonary Tuberculosis, by Henry Sewall; Additional Diagnostic Methods for Cases of Suspected Intraocular Tuberculosis, by A. H. W. Caulfield; The Adrenals and Thyroid in Experimental Tuberculosis, by G. B. Webb, G. B. Gilbert and C. T. Ryder.

Dr. Willis's contribution has a preface by Allen K. Krause in which he justly says that the advan-

tages of such a study are plain and it is to be hoped that it may throw light upon some features of experimental anthracosis which have remained obscure because of technical obstacles. The titles of the four other articles and their well known authors speak for their importance, but to review them even in part would take more space than can be given to reviewing in a medical journal. However, attention should be called to the fact that the May number of the *American Review of Tuberculosis* has over ten pages of valuable abstracts from the most important articles on tuberculosis which have appeared recently in European and American medical magazines.

New Publications Received.

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[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

RESURRECTING LIFE. By MICHAEL STRANGE. With Drawings by JOHN BARRYMORE. New York: Alfred A. Knopf, 1921. Pp. 86.

OUTWITTING OUR NERVES. A Primer of Psychotherapy. By JOSEPHINE A. JACKSON, M. D., and HELEN M. SALISBURY. New York: The Century Company, 1921. Pp. 403.

THE RUSSIAN BOLSHEVIK REVOLUTION. By EDWARD OESWORTH ROSS, Ph. D., LL. D., Professor of Sociology, University of Wisconsin. Illustrated with Over Thirty Photographs. New York: The Century Company, 1921. Pp. xvi-302.

CZECHOSLOVAK STORIES. The Interpreters' Series. Translated from the Original and Edited with an Introduction by Sarka B. Hrbkova, Professor of Slavonic Languages and Literatures at the University of Nebraska (1908-1919). New York: Duffield & Company, 1920. Pp. iv-330.

HUMAN BEHAVIOR. In Relation to the Study of Educational, Social and Ethical Problems. By Stewart Paton, M. D., Ex-President, Eugenics Research Association; Lecturer in Neuro-Biology, Princeton University; Author of *Textbook on Psychiatry and Education in War and Peace*. New York: Charles Scribner's Sons, 1921. Pp. 465.

THE DIAGNOSIS AND TREATMENT OF INTUSSUSCEPTION. By CHARLES P. B. CLUBBE, L. R. C. P., M. R. C. S., Consulting Surgeon to the Royal Prince Alfred Hospital; Consulting Surgeon to the Coast Hospital, Sydney; Honorable Surgeon to the Royal Alexandra Hospital for Children; Late Lecturer in Clinical Surgery, University of Sydney, New South Wales. Second Edition. London: Henry Frowde, Hodder & Stoughton, 1921. Pp. x-91.

TRAUMATIC SURGERY. By JOHN J. MOORHEAD, B. S., M. D., F. A. C. S. Late Lt.-Colonel, Medical Corps, American Expeditionary Forces; Professor of Surgery and Director, Department of Traumatic Surgery, New York Post-Graduate Medical School and Hospital; Visiting Surgeon to Harlem Hospital; Attending Surgeon, Park Hospital; Consulting Surgeon, All Souls' Hospital (Morristown, N. J.); Lt.-Colonel, Medical Reserve Corps, U. S. Army. Second Edition Entirely Reset. Philadelphia and London: W. B. Saunders Co., 1921. Pp. 864.

MANSON'S TROPICAL DISEASES, A MANUAL OF THE DISEASES OF WARM CLIMATES. Edited by Philip H. Manson-Bahr, D. S. O., M. A., M. D. (D. T. M. and H.) Cantab. M. R. C. P. Lond. Physician to the Hospital for Tropical Diseases, London, and the Albert Dock Hospital; Lecturer at the London School of Tropical Medicine; Lecturer on Tropical Diseases at the North-East London Post-Graduate College; Examiner in Tropical Medicine to Cambridge University. Seventh Edition, Revised and Enlarged. With Twenty-one Color Plates, Six Half-tone Plates, 404 Figures in the Text, and Thirty-one Charts. New York: William Wood & Company, 1921. Pp. xvi-960.

Practical Therapeutics

MARIENBAD SPRINGS

BY ERNEST F. KERBY, M. D.,
New York.

Ancient chronicles dating back to the fourteenth century contain references to the therapeutic properties of natural mineral springs. Paracelsus, in the sixteenth century, extolled their virtues and sought a scientific explanation of their mode of action. More than a hundred years ago Marienbad was already established as a health resort of great renown on account of the potency and variety of the natural springs with which nature has blessed this pretty Bohemian town. To be able to realize fully the wide appeal of the Marienbad cure one has to visit the city at the height of the season, when inhabitants of every conceivable country flock together on their annual pilgrimage in search of health. It is in keeping with the spirit of our times that the Marienbad municipality has decided to annihilate distance by exporting their products into remote countries, so that the natural treasures are accessible to all instead of being reserved for the few who can undertake the voyage to the springs. The news that Marienbad products will be available for general use in this country, will be hailed with satisfaction by all physicians who have had an opportunity in the past to become acquainted with their therapeutic possibilities. It appears opportune at this juncture to give a description of the outstanding features of the principal springs and to discuss their mode of action.

Kreuzbrunnen is one of the most important of the Marienbad springs. Its chief constituents are sodium sulphate and sodium bicarbonate and it also contains appreciable quantities of calcium and magnesium bicarbonates. The essential action of this water consists, therefore, in promoting increased elimination. It is of interest to point out in this connection that the usual explanation of the action of saline cathartics has become untenable in the light of recent pharmacological researches. For long the theory had been accepted that all members of this group of purgatives derived their potency from the fact that they are not absorbed by the intestinal mucosa and that for this reason a large amount of water is retained within the lumen of the gut in accordance with osmotic requirements. The resulting increase in bulk of intestinal contents was then thought to incite more vigorous peristalsis. The simple observation that a full dose of salts usually calls forth a watery evacuation shortly after it has entered the stomach, served to indicate that the problem was more complicated. It has been definitely established (1) by accurate observations in cases of ileal fistulae and by means of x ray examinations that the salts administered only reached the cecum four hours after ingestion in cases where a copious evacuation had resulted after two to three hours. It must, therefore, be concluded that absorption had actually taken place in the small intestine, and that the salts in circulation had stimu-

lated the nervous mechanism of the colon. An important finding is the fact that up to fifty per cent. of the sodium sulphate administered is excreted by the kidneys within eight hours. Clearly, therefore, the action of the saline group is more complex than has been generally assumed.

These observations give a clue to the properties of Kreuzbrunnen which is probably used more extensively than any other Marienbad spring. It increases elimination without irritating the intestinal mucosa or renal epithelium. Experience has shown that it is suitable for prolonged courses of administration without deleterious effects. It has, therefore, a wide range of utility in chronic intestinal catarrhs and habitual constipation. As the stools are rendered soft and unirritating, Kreuzbrunnen is gratefully appreciated by sufferers from hemorrhoids, anal ulceration, and painful pelvic conditions. The typical Marienbad cure has as its aim the reduction of excessive adiposity. This is a problem which is receiving increasingly vivid attention, since the interpretation of life insurance statistics has demonstrated its true significance from the point of view of preventive medicine. It has been shown that the expectation of life decreases proportionally as the weight rises above the normal average. The unhygienic habits of life which economic necessity is forcing upon the majority of people at the present time, all tend to swell the ranks of the overweights.

Small wonder, therefore, that Kreuzbrunnen, the time honored specific against obesity, is enjoying increasing popularity. It is also used for a variety of disorders of allied etiology, such as arteriosclerosis, elevated blood pressure, fatty degeneration of the heart, and for congestive conditions generally. Finally, patients suffering from renal insufficiency often experience striking relief during a course of Kreuzbrunnen; owing to the increase of elimination effected, many of their symptoms are alleviated and their sense of well being and their capacity for useful occupation are increased.

The details of a course of treatment vary naturally with the individual needs of the patient. On the whole, the chief aim has been to obtain the largest possible daily stool. A different plan of treatment has been advocated by Rheinboldt (2). He suggests a subdivision of the course into three periods. During the first, the dose of the water is varied, until the minimum amount is determined, which will insure one normal stool every morning. Throughout the second period the patient establishes the habit of obtaining, with the help of the minimum dose, a full daily evacuation. When this aim has been fully attained, the last period is entered upon; during that time the dose is gradually diminished by substituting a weaker water and, finally, plain water. This course of treatment occupies at least four weeks. It goes without saying that the general hygienic régime of the patient receives due attention at the same time.

The outstanding characteristic of the Rudolfsquelle is its richness in calcium and magnesium bicarbonates. It also contains protoxide of iron. This water is used chiefly on account of its alkaline properties, and it may be taken for long periods without interruption. It is prescribed for patients suffering from gouty manifestations and renal calculi. Reliable results may be expected in cases, where the urine is unduly acid or where it is to be rendered alkaline in inflammatory conditions of the kidney, bladder, and genitourinary passages. Rudolfsquelle has been used tentatively in a number of disorders thought to be dependent on, or accompanied by diminution of the alkali reserves of the blood. This miscellaneous list includes affections like diabetes, chronic eczema, and liability to attacks of bronchitis and frequent catarrhs of the upper respiratory tract. Another field of utility is represented by the group of disturbances associated with hyperacidity of the gastric secretion. The combined administration of Kreuzbrunnēn and Rudolfsquelle offers some practical advantages in the treatment of gastritis and gastric and duodenal ulcers, as well as after gastrojejunostomy. Hyperemesis gravidarum, especially if accompanied by acidosis, may also be included in this group from a therapeutic point of view. In all these conditions the two Marienbad waters solve the problem of neutralization of acid and of increasing elimination in a convenient and pleasant fashion.

By a process of evaporation of Kreuzbrunnēn and Ferdinandsquelle Marienbad spring salt is prepared. It has been widely employed in the place of the waters, especially where a reduction of the bulk was desired for greater convenience.

Our knowledge of the ultimate properties of natural springs, especially as compared with artificial solutions, is still rather incomplete. Of course it must be realized that the results of analysis of the various spring waters only reflect the temporary state of our knowledge of chemistry. Thus, with the growth of this science, the analytical tables have undergone repeated changes. One of the latest additions, for instance, is the discovery of helium in the springs. This may or may not be of therapeutic importance, but it serves to show that our knowledge even of the chemical composition of Marienbad waters cannot be considered to be complete. This applies with still greater force to the physicochemical problems involved. We have only recently learned to attach importance to colloidal phenomena and the varying rates of ionic dissociation of salts in solution. Further research along these lines may assist in throwing some light on the difference between natural and artificial solutions. Another chapter of inquiry was opened soon after Madam Curie's discovery of radium, when it was shown that Marienbad springs were endowed with a remarkably high degree of radioactivity. This is due to the presence of radioactive ore deposits in the geological formation of the district Marienbad is situated in. Joachimsthal, the famous centre of radium production, belongs to the same region. The suggestion that radioactivity of the springs may enhance their curative effects appeared for a long time to be not a solution of the problem, but merely

a restatement of it under another guise. However, recent researches have brought some explanations. It is now definitely established that, while strong doses of radium destroy, small doses on the contrary stimulate the physiological activity of cells (3). This property has been made use of in actinotherapy with unequivocal results. For instance, exposure of the spleen and of the bone marrow gives rise to an increase in the production of erythrocytes. The same principle has been applied in the treatment of organs, the function of which is deficient owing to pathological changes. Thus the amount of urine excreted has been markedly increased in cases of renal insufficiency due to chronic nephritis. The next link in the chain of evidence was the demonstration of the fact that the presence of radioactive substances in the blood stream exerted a stimulating effect on the tissues of a nature identical to that obtained by direct radiation. It is, therefore, conceivable that the secret of the efficiency of Marienbad waters—the mysterious "spirit of the spring" hinted at by ancient writers—depends on radioactive properties and special physicochemical factors as much as on the felicitous combination of its mineral salts.

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2. RHEINBOLDT, M.: *Ztschr. f. physikal. und diat. Therapie*, xiii, 161, 1909.
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Renal Function in Vascular Hypertension.—James P. O'Hare (*Boston Medical and Surgical Journal*, April 1, 1920) considers it very important to differentiate vascular hypertension from chronic nephritis. While both may show albumin and casts, the lesion in the kidney of the vascular hypertension case is very slight and confined chiefly to the vessels, while in the chronic nephritic the process is largely in the renal parenchyma. The latter lesion is usually progressive, whereas in the former the disease in the renal vessels is stationary or so slow that its progress can scarcely be recognized. The great majority of patients with vascular hypertension die from cerebral hemorrhage, some from cardiac disease, but in only a few does the disease of the renal vessels become so great that the parenchyma is progressively reduced and uremia supervenes. The treatment of vascular hypertension has often been unnecessarily rigorous because of the mistaken diagnosis. The vascular hypertension patient can be recognized clinically by his characteristic healthy appearance, his lack of pure renal symptoms, and by routine physical and laboratory examination, especially by the tests of renal function. Twenty-five cases of vascular hypertension are tabulated to show how readily the functional tests in common use establish the diagnosis. It is briefly summarized by saying that in vascular hypertension: 1. The specific gravity of the urine shows no loss of power of concentration, as in chronic nephritis; 2, albumin and casts appear in the same quantities in both diseases; 3, the functional tests show but little renal impairment; 4, a markedly increased night volume of urine indicates a possible renal death.

Treatment of the Chronic Intestinal Invalid.—

John Bryant (*American Journal of the Medical Sciences*, January, 1921) says that there are five distinct factors of fundamental importance in treatment of the chronic intestinal invalid, which are social, mental, dietary, orthopedic, and glandular. The common objective of all these factors is increased resistance of the patient to fatigue, and they must be applied in overlapping sequence in order to yield the maximum benefit. The chronic intestinal invalid usually recovers at a rate inversely proportionate to the amount of surgery to which he has been subjected. The physician who will take the time and trouble may promise such a patient a ninety per cent. prospect of a reasonable degree of improvement, and an eighty per cent. prospect of a marked or satisfactory degree of improvement as a result of a few months of nonsurgical treatment. Treatment which does not train the patient to avoid or to recover from future relapses with a minimum of medical assistance, falls short of what the chronic intestinal invalid has a right to expect.

Pathological Changes in the Striped Muscles in Choleric Diarrhea.—H. Sloboziano (*Presse médicale*, January 12, 1921), in three out of six cases of cholera infantum, found acute fatty degeneration of the myocardial cells, which accounted for the small pulse and bradycardia witnessed in these cases during life. The other striped muscles, including the diaphragm, rectus abdominis and psoas, examined in eight patients, were found involved eight times out of a total of thirteen muscles studied. They showed either acute disseminated degeneration, cloudy swelling, or fibrillar aspect of the muscle cells. The dyspnea of cholera infantum may be partly attributed to changes in the myocardium and muscles of respiration. The poison of the disease is apparently soluble in the fatty substances normally present in certain amount in the muscles of small children, and its dissolution in them promotes injury of the cells. After the second year of life these cellular fats are present only in much smaller amount, and choleric diarrhea therefore to a marked degree loses its serious aspect in such children.

The Relation of Fistula in Ano to Phthisis.—Herman A. Brav (*American Medicine*, December, 1920), from personal observation, is led to the following conclusions:

1. Tuberculous fistula of the anus is usually secondary to tuberculous disease of the lungs.
2. Pulmonary phthisis is rarely, if ever, secondary to fistula in ano, either before or after operation.
3. Tuberculosis of the anal region should be dealt with radically, as wounds upon the consumptive heal more readily than is generally supposed.
4. When the patient's general condition will permit, the surgeon should operate on all fistulas, regardless of their type.
5. The surgeon should not refuse to operate on persons suffering from a mild form of phthisis, for in incipient cases the operation is always justifiable.
6. There is no reason why a tuberculous focus should not be extirpated here as elsewhere. The operation should be followed by a scraping of the fistulous tract. Unless the lung trouble is active and far advanced, operation is not contraindicated.

Streptococcal Leptomeningitis Due to Chronic Suppurative Otitis Media.—S. Scott (*Lancet*, November 27, 1920) discussed the case of a ten year old girl who had ear discharge some months before. Symptoms were headache, vomiting, sensation of falling, and twitching of face and arms, followed by coma, retraction of the head, and extensor rigidity of the hamstrings. Her temperature was 104°, pulse 130, and respiration 30. The radical mastoid operation, with translabyrinthine drainage and lumbar thecal, was performed. The mastoid antrum and cells contained pus, granular and cholesteatomatous material. An extradural abscess contained nearly a dram of pus. The wound was packed open with dressings. Lumbar puncture, repeated every twelve hours, on the fourth day revealed sterile spinal fluid. On the fifth day, the child was convalescing.

Primary Disease of the Pelvic Lymph Glands.

—John T. Williams (*Boston Medical and Surgical Journal*, February 24, 1921) asserts that primary enlargement of the pelvic lymph glands is a distinct clinical entity. The diagnosis is to be based upon a pelvic mass definitely not connected with the uterus or its appendages, which gives rise to pain and tenderness in the iliac fossa of the affected side, with or without elevation of temperature, and with or without psoas spasm on the affected side. The white count in the few cases so far observed has been only slightly increased. The treatment is the same as that of enlarged or diseased glands elsewhere in the body. A mass definitely containing pus should be opened. Where the glands are acutely inflamed but suppuration has not taken place, treatment should be restricted to rest and cold applications. Where the enlargement causes pressure on important organs and does not rapidly subside under palliative treatment, excision is indicated.

The Peristalticlike Nature of Organic Responses.—P. F. Swindle (*American Journal of Psychology*, April, 1919) concludes that reasons were given for supposing that all muscular responses of long duration are discontinuous in the sense that the nervous correlates of a limited portion of such a response are not exactly identical with those of any other portion of the same response. Assuming, then, the discontinuity of all the muscular responses or the peristalticlike nature of responses in general, and speaking only of the behavior correlates of the structures that function, the following law of induction can be stated: The initial element of the innately associated series of elements of the responses of long duration conditions or induces its qualitatively most similar element; this in turn induces its most similar element which has not occurred immediately before, and so on until the qualitatively most dissimilar element to the initial one is induced. This law is essentially the same as a law of color induction, stated as follows: In successive and simultaneous color induction, any color induces first itself and last of all its antagonistic color. The only difference between the two statements of the same law of behavior is that, in the one case, emphasis is laid upon the qualitative natures of the muscular movements which succeed one another, while in the other the succession of psychical states only are brought into consideration.

Acute Lobar Pneumonia; Treatment.—A. L. Burnett (*Colorado Medicine*, January, 1921) sums up the treatment of this disease in these four rules: 1. Afford good hygiene and careful nursing. 2. Conserve and replenish the patient's energy. 3. Promote active elimination. 4. Treat the symptoms when they arise, not before.

Raised Blood Pressure.—Paul M. Chapman (*Practitioner*, January, 1921) says that we must not assume all high blood pressures to be evil, and suggests that the following considerations are worth remembering: 1. The nourishment of the cardiac muscle is conditioned by the blood pressure in the aorta. 2. A plus pressure often means increased cardiac vigor. 3. A minus pressure often entails cardiac malnutrition. 4. A plus pressure should not always, as a matter of routine, be taken to be harmful. 5. The condition of the patient himself under treatment is as yet all we have to go by, and we have to consider every circumstance before we can exercise a proper discretion in our treatment of blood pressure, except in extreme cases.

The Orbital Cardiac Murmur.—A. E. Vipond (*American Medicine*, March, 1921) reports nine cases where a systolic murmur was heard over the orbit. He has found it in Graves's disease, endocarditis, aortic and mitral valvular disease, in dextrocardia and in congenital heart disease. To detect this orbital murmur the room should be free from noise and the murmur is exaggerated by making the patient exercise before examination. The stethoscope used was the ordinary Bowles type, placed over the eyeball, with the eyelids closed, a little to the outer side to exclude respiratory nasal sounds. This murmur was never found in connection with the normal heart.

Letters to the Editors.

MAN VERSUS THE MICROBE.

To the Editors:

NEW YORK, May 21, 1921.

It is always a pleasure to the old chap to see a return to sane thinking. This is true in the world at large; it is also true, but in a greater degree, in what relates to medicine, when one is or has been during many years an all around practitioner. No one believes more than I do in the proven specificity of some microbes in the causation of disease, or indeed, when present, in their farreaching importance in some local injuries. But, when at every turn in the road, everywhere and among all people, there is the continuous outcry against the ever-present and inimical microbe and what terrible consequences arise from its presence, unless it is neutralized, its poison made nonexistent, and this, too, by powerful, so-called disinfectants, then the thoughtful mind cries a revolt.

To me, the effort made in so many directions and the expense in mind, body and estate, to bring to an end, or greatly diminish the great white plague (tuberculosis) are sadly lacking in sanity. If tuberculosis were very contagious to the larger number of men, women and children, where would we be with our abominable housing and methods of traffic

in which fellow humans are crowded like cattle for not a short time of the twenty-four hours. It is only contagious, as I believe, in very small measure and only then when the soil is ripe for its culture. Let us stop this outcry for more sanitariums and too much regulated lives for the very few, relatively.

Let us return, or rather advance more and more to the sane judgment that good surroundings—healthful, sufficient air space, with sunlight and sufficient nutritious food, properly prepared, are the essentials in our combat against this disease and indeed, against many others of supposed infectious or contagious type, or which in some instances are proved to be so.

In some of these cases, like influenza, they are air borne, as I believe,—but the microbe itself has small importance. What the real poison of the disease is we do not know and may not know for a long time in the future. While we do know that a few diseases, but again, relatively few, are connected primarily, always up to date, with the presence of a microbe, singly or combined, its power for evil is not always the same. Sometimes it is very virulent, but the cases are in main few. Again, the microbe, the *habitat* of the poison, carries with it slight danger to the one attacked, but is very widely disseminated. I have merely to mention what occurs in epidemics of scarlet fever, of measles, of whooping cough, to carry home the truth of my statements.

The sooner we learn and bring to mind constantly that microbes are often so-called scavengers of disease, and not the initial, most important cause, the better for the world and now, the too much and unnecessarily frightened humanity. Let our main watchwords be: more and better homes, sufficient good, nutritious food, sunlight, sanitary employments, and also, in time of sickness, a few well selected and useful drugs, or combinations, from the old doctor's storehouse of wide observation and experience, backed up with a great fund of intelligence, integrity and common sense.

BEVERLEY ROBINSON, M. D.

129 EAST THIRTY-FIFTH STREET,

TOBACCO.

WILKES-BARRE, PA., June 15, 1921.

To the Editors:

In article, "The Effect of Tobacco on Man," by Gies, Kahn and Limerick, page 810, the following paragraph will be found:

The sequence of the potency of the different forms in which tobacco is generally used runs as follows, in the order of greatest degree to least: Chewing, smoking pipe, smoking cigar, smoking cigarette. It can thus be seen that, contrary to the prevailing belief among laymen, the cigarette is in fact the least harmful form in which it is possible to habitually use tobacco. There is not the slightest foundation for the popular notion that the paper or the tobacco used in the manufacture of the cigarette contains any substance that is especially injurious to the human organism. Emphasis on the relative innocuousness of the cigarette is deemed justified by the persistence with which the misinformed strive to convey a contrary impression. It is equally deserving of mention that analysis of tobacco does not indicate with any degree of preciseness the actual toxicity of, say, a cigar or a cigarette made of it, for a great part of the volatile constituents of the plant is completely destroyed in the burning, hence does not enter the body.

With this paragraph I wish to take exceptions. At my request, Mr. Joseph J. Walsh (Inspector of Mines), of Nanticoke, Pa., made tests. The following is his report:

For the purpose of determining the amount of carbon monoxide in the gases drawn through a cigarette, and also to determine what amount of carbon monoxide is absorbed by the tissues of the mouth, samples of the products due to this form of combustion was collected in the following manner: A rubber bulb force pump was used for the purpose of collecting the samples. The pump consists of a rubber bulb and two short rubber tubes, one attached to each side of the bulb, the whole being fitted with a valve mechanism. When the bulb is compressed its contents are forced through the discharge tube, and, when released, it expands, drawing air in by other tube, which forms an inlet. Sample number one was collected by putting the discharge tube into a sample bottle and inserting a lighted cigarette in the intake tube; the bulb was then pressed and inflated fifteen times, thus pumping into the sample bottle a sample of the products of combustion. Sample number two was collected by means of same instrument and in the same manner, excepting that the discharge tube was placed in the mouth, into which a sample of the products of combustion was pumped, which sample then passed from the mouth through a glass tube into a sample bottle.

SAMPLE NUMBER ONE.

Carbon dioxide	2.09 per cent.
Carbon monoxide	2.22 per cent.
Oxygen	16.23 per cent.

SAMPLE NUMBER TWO.

Carbon dioxide	3.00 per cent.
Carbon monoxide	1.63 per cent.
Oxygen	15.40 per cent.

The following samples were drawn through a lighted smoking pipe, and collected in the same manner as above. Sample three was pumped directly into the bottle; sample number four passed through the mouth:

SAMPLE NUMBER THREE.

Carbon dioxide	4.10 per cent.
Carbon monoxide	2.75 per cent.
Oxygen	14.00 per cent.

SAMPLE NUMBER FOUR.

Carbon dioxide	4.46 per cent.
Carbon monoxide	2.08 per cent.
Oxygen	14.30 per cent.

The following is the result of analysis of air expelled from the lungs while in the ordinary performance of work:

AIR EXPELLED FROM THE LUNGS.

Carbon dioxide	3.67 per cent.
Oxygen	17.22 per cent.
Nitrogen	79.11 per cent.
Carbon monoxide	0.00

PURE AIR.

Carbon dioxide .....	.03 per cent.
Oxygen	20.93 per cent.
Nitrogen	79.04 per cent.

From these analyses it is apparent that from six to seven tenths of one per cent. of the carbon monoxide contained in the gases given off during smoking are absorbed in the upper air passages. Inhaling the smoke would materially increase the amount of carbon monoxide absorption, and the continued absorption of carbon monoxide certainly

would have a deleterious effect on the human organism.

The continuous inhalation of one fifth of one per cent. of carbon monoxide for a period of six hours is sufficient to cause death. As the cigarette smoker is, as a rule, an inhaler, I cannot understand why assertion is made that the cigarette is the least harmful form of tobacco, especially when the smoker absorbs a larger amount of carbon monoxide.

27 EAST SOUTH STREET. D. W. COLLINS, M. D.

TOBACCO.

To the Editors:

NEW YORK, June 17, 1921.

"The cigarette is, in fact, the least harmful form in which it is possible habitually to use tobacco," because it yields the smallest amount of toxic materials.

As far as they extend, the tests reported to have been made by Mr. Joseph J. Walsh and quoted by Dr. D. W. Collins confirm what has been said by my collaborators and me of the relative innocuousness of the cigarette.

Carbon monoxide is not the most toxic constituent of tobacco smoke. The inhalation of tobacco smoke is not confined to cigarette smokers.

Persons habituated to the cigarette usually exhibit the more profound symptoms of acute tobaccoism after having smoked a cigar or a pipe, which fact proves the greater potency of the latter forms of smoking tobacco.

550 RIVERSIDE DRIVE. O. VICTOR LIMERICK.

CONTAGION.

To the Editors:

NEW YORK, May 23, 1921.

In your issue of May 18, 1921, page 751, Dr. Arthur I. Blau, signing himself as diagnostician, Department of Health, writes as follows:

Not infrequently I encounter cases of contagion in premises, the seat of that contagion weeks or months ago. This occurrence, in my mind, is not merely incidental. It is a late infection caused by the germ or poison of contagion still present in those premises, left over by the patient after recovery, which has not been removed or destroyed by the disinfection or renovation. This is not a mere assumption, for we know that the poison of the contagious diseases is very tenacious, particularly that of scarlet fever, and clings for weeks or months to furniture, carpets, and other household articles.

Inasmuch as these views were submitted for publication without my knowledge and are directly at variance with the teaching and practice of the New York City Department of Health, I request that you publish this letter in order that the readers of the JOURNAL may not be misled.

After prolonged and thorough experimentation, both in the field and the laboratory, the department decided that terminal disinfection was wholly ineffective in diminishing the spread of contagion. The department believes that persons, either as patients, convalescents or carriers, are practically the sole source of infection. Together with thorough concurrent disinfection, the department finds that procedures based on the above belief are entirely satisfactory.

LOUIS J. HARRIS, Director,
BUREAU OF PREVENTABLE DISEASES.

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NEW YORK, WEDNESDAY, JULY 20, 1921.

Collectanea

The Status of Vaccination Against Influenza.

—Prophylactic vaccination against influenza was practised extensively during, but mostly following, the recent epidemic of the disease. From a scientific point of view, such inoculation seems somewhat premature, since the etiological factors are not established, says the *Journal A. M. A.*, May 28, 1921. In some districts stock cultures were employed; in others a culture of a strain or strains isolated during the epidemic, and in still others a mixed vaccine composed of the bacillus of Pfeiffer, the streptococcus, the pneumococcus, the staphylococcus and other organisms. McCoy presented his impression, as gained from the uncontrolled use of these vaccines, that while theoretically they might be of value in the prevention of influenza, yet in every case in which they were tried under perfectly controlled conditions they failed to influence either morbidity or mortality. A well conducted investigation is worthy of note even when the outcome is negative in character. It may turn us away from false hopes and force us to seek new solutions for the problem at hand. In an elaborate study, Jordan and Sharp of the Department of Hygiene at the University of Chicago conducted observations under the auspices of the influenza commission established by the Metropolitan Life Insurance Company of New York on approximately six thousand persons from November, 1919, to June, 1920. About one half of these were vaccinated with a saline suspension of a standard mixed vaccine prepared by Dr. W. H. Park, of the New York City health department. The remaining half were not vaccinated. Comparable members of the two groups in different localities lived under essentially identical environmental conditions. The influenza attacks among the vaccinated numbered 118, or 4.1

per cent.; among the unvaccinated the morbidity from this disease was 4.8 per cent. Rhinitis and bronchitis developed with about equal frequency in the two groups. There were slight variations in the incidence of the few cases of pneumonia, but the Chicago bacteriologists regard it as unlikely that any considerable degree of protection against influenza was conferred. Is it unfair to the proponents of vaccination against influenza and other respiratory infections to say: "Value unproven"?

The Psychopathology of the Fugue.—Erwin Popper (*Monatschrift für Psychiatrie und Neurologie*, March, 1920) describes the case of a student who left his school and was found some days later on the school grounds suffering from a total amnesia extending over a week's time. Letters describing his travels were subsequently received. The student had always appeared normal, although he indulged in phantasy stories and descriptions of his exploits and travels. He himself denied all knowledge of these phantasies. The fugue is interpreted as a type of hysterical wish fulfilment delirium. His fantasy life together with his normal life constitute an hysterical double personality. It is particularly striking that the retrograde amnesia extends over all the periods of apparent pseudologia phantastica, in this way appearing as an hysterical repression of all these periods. No further analysis of the patient to overcome the hysteria was attempted.

High Mortality Rates.—In the United States in 1919 one mother died for every 135 babies born, and every eleventh baby born died before he was a year old. That these rates are excessive is shown in a bulletin issued by the United States Department of Labor through the Children's Bureau, and just revised to compare the latest rates for the United States with those for foreign countries.

Six countries are shown to have a lower infant mortality, and sixteen in a group of seventeen a lower maternal mortality than the United States. Not only do we lose more mothers in proportion to births than practically any other civilized country, but we apparently lose more on an average each year than the year before. Whereas in other countries there has been a decrease in the death rate from childbirth, the rate in the United States arose from 6.1 in one thousand births in 1915 to 6.2 in 1916, 6.6 in 1917 and to 7.4 in 1919. Moreover, in this country there is no appreciable decrease in the proportion of babies who die from causes largely connected with the care and condition of the mother.

Experience has proved, the bulletin points out, that thousands of deaths of both mothers and children could be prevented every year by public measures for the protection of maternity and infancy. In New York city, among 4,496 mothers who were supervised by the New York Maternity Centre Association before and after the birth of their babies, the maternal mortality rate was less than one third the rate of the United States and the rate for deaths in early infancy was less than half that for the city as a whole. In other cities of the United States and in foreign countries the institution of infant welfare measures has been followed by greatly decreased rates.

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WHOLE No. 2214.

Some Remarks on the Elements of Diet in Infancy, with Special Reference to the Employment of Czerny and Kleinschmidt's Butter Flour Mixture*

By J. P. CROZER GRIFFITH, M. D.,
Philadelphia,
and
A. GRAEME MITCHELL, M. D.,
Philadelphia.

In an article by Czerny and Kleinschmidt (1) describing the method of production and the results of the employment of their butter flour mixture, they open with the explanation of the thought which led to the construction of the product. They speak of the composition of human milk and the consequent suggestion which presents itself—that there is probably something in Nature which demands for the infant the relative proportions of fat, protein, and carbohydrate which exist in the milk the human breast supplies. They speak, too, of the assumption by many that it is a matter of indifference whether the fat of the food is largely or entirely replaced by carbohydrate; and evidently do not believe that this is correct, leaving it for the writers who make this assertion to bring forward positive proof in support of it.

These statements, emanating as they do from writers of such well known distinction, and opposing, as they do, so many expressed views of other investigators likewise of prominence, naturally arouse interest and stimulate the desire to know just what is to be considered most nearly correct in this much discussed question. It is evident that it is a question as yet far from final solution; yet the thought has long been present with us that the giving of high protein percentages to normal infants was not a matter of indifference, and that even the use of such food in many cases of digestive disturbance might be harmful rather than beneficial. Further, it has always seemed to us a question whether the substitution of fat by large percentages of carbohydrate, useful as it is in so many cases, was one which was to be persisted with as entirely satisfactory after health had been regained. Our conviction has long been that a relationship in diet closer in some respects to the proportions seen in

human milk was eminently desirable. These views are, of course, shared by many others, and have been repeatedly expressed by them; and yet much that one reads in modern medical literature would lead to the idea that they were without satisfactory scientific foundation. Many writers in their attempt to simplify infant feeding have gone to such an extreme that the efforts would seem to be toward rendering the preparation easy for the physician rather than to make the food the most suitable for the infant; and we see methods and formulæ recommended which are a reversion to those which the experience of many years ago had relegated to the undesirable.

A review of the enormous literature on the subject of the digestion and action of the different ingredients of the infant's diet is, of course, out of the question; but reference to a few of the more important comparatively recent statements in medical literature in support of our contention may well be permitted.

As regards the protein, Benjamin (2) in a long article of over one hundred pages gives an exhaustive review of the literature of the subject, and details his own experiments. He speaks of the undoubted injuries which may follow the employment of an excess of protein, noted especially in a continued failure to gain weight and a general muscular atony, such as is often seen in the employment of protein milk. The fact that malt soup is often a remedy for this condition has been attributed to its low fat and high carbohydrate percentage; but it must not be forgotten that it also possesses a percentage of protein which is low, and he believes that the essential factor in many instances. Glanzmann (3) studied the effect of casein milk in various diseases, and found that when it was given in over-amount, evidences of injury from protein developed, shown by unhealthy appearance, pallor, loss of strength, meteorism, and subfebrile temperature.

*From the Wards of the Children's Hospital of Philadelphia and the Children's Medical Ward of the Hospital of the University of Pennsylvania.

He regards it, therefore, as an unsuitable diet for a healthy child, and not adapted for long employment even in those with digestive disorders. Hoobler (4) in a careful study of the subject details his own experiments, which confirm the views of others that protein is often given too freely. Whereas seven per cent. of the total calories represents the utmost need of the infant, in such foods as that recommended by Finkelstein the protein is about thirty per cent. Protein fed in excess causes an increase of the protein metabolism, but does not reduce the amount of the fat and carbohydrate metabolized, which must then be drawn from the stored up fat and glycogen, unless sufficient is supplied in the food. When fed greatly beyond its need protein is likely to produce a condition of stupor. He thinks the employment of any high protein diet is justified only as a temporary therapeutic measure. Howland and Stolte (5) found that the addition of casein to the diet of breastfed children did, it is true, increase the weight, but caused the development of exudative symptoms and diminished decidedly the calcium balance. A very useful review of the literature of the subject, together with his own experiences, is given by Tanaka (6). It would appear from this that although infants absorb an excess of protein readily, they are unable to retain it, indicating that there has been an overburdening of the system by protein. The children to whom a high protein diet was administered finally entirely ceased to gain. Finally Bessau (7) in a long article upon the pathology of injuries by milk maintains that there is no more doubt about the production of injury by the action of the protein than there is by that of the fat, and by this he does not mean merely evidences of indigestion. The protein can produce damage not only through a lack of perfect proportion among the milk elements, but by the presence of an actual quantitative excess, and he asserts that the well known blue gray coloration of the skin often seen in infants fed on casein milk is a symptom of the high protein diet.

The references given are selected from many, and are enough, we believe, to show that both clinical experience and metabolic investigations support the opinion that a high protein diet, except for certain specific purposes, is not desirable, and that the difference in the ratios of fat and protein as seen in human milk and in cow's milk, respectively, is of significance.

As regards the fat and the carbohydrate of the food, the injuries which may follow a high percentage of fat are too well known to demand any discussion. The cause of this is not so certain. The relief of vomiting by the butter flour mixture, to which we shall refer later, appears to lend proof to the opinion that the difficulty in the digestion of cow's milk fat depends upon the high percentage of volatile fatty acids present. The favorable experience, however, of Moro (8) and of Rietschel (9) with foods analogous in composition to the Czerny-Kleinschmidt butter flour mixture, yet prepared without any driving off of the fatty acids by cooking, would indicate that there may be other reasons for the fact that the high fat percentage in this mixture does not increase the tendency to vomit. Many

cases suggest that a common cause of injury by fat is through the formation of soap stools, while diarrhea produced by an excess of fat occasions a loss of the alkalies and a diminished calcium absorption (Holt, Courtney, and Fales) (10). On the other hand, the importance of fat in the diet is a matter which cannot be disputed. Holt, Courtney, and Fales assert that a certain percentage of fat must be present to obtain a satisfactory absorption of calcium, and recent testimony from other writers is all in favor of the value of fat. The importance of butter fat on account of the vitamins contained in it has been dwelt upon by many recent writers and need not be discussed in this connection.

Although it has repeatedly been shown that the carbohydrates may largely replace fat, yet that they can do so satisfactorily is denied by many. Orgler (11), for instance, speaks of the large absorption of fat, both from human milk and from cow's milk, and believes that children in whom the carbohydrates have to a great extent replaced this do not do as well when fed in this way. He maintains that the increase of the carbohydrates at the expense of the fat causes a loss of water from the system. He emphasizes the fact that animal experimentation has shown that a certain amount of fat is necessary, and points out the significance of the high percentage of fat present in breast milk.

Yet in spite of the necessity for the administration of fat, the actual employment of it often causes many difficulties. These may be overcome in different ways. Bessau (7) emphasizes the fact, already known, that it is not so much an excess of fat which is detrimental as the lack of a proper proportion to the other ingredients of the diet; and that the fat may remain in the food unaltered in quantity if the amounts of the other elements are correctly arranged. That the fat is better tolerated when an amylaceous substance has been added to the diet is well known. It is exemplified, for instance, in the employment of malt soup, and even in the simpler preparations where a cereal decoction is employed as a diluent instead of water. Regarding the action of starch there are various opinions. We need not enter upon them in this connection. It is probable that there is more than one method in which the favorable result is obtained. The subject is ably discussed by Bessau. In any event, the fact of its value remains; and did it lack proof, the experience of Czerny and Kleinschmidt would remove all doubt. These authors in a somewhat empirical but very successful manner devised a food which permitted the employment of a high fat percentage in combination with a percentage of carbohydrate also high, but with the protein reduced to approximately the amount present in human milk. They insist upon the great importance of having the relationship of the fat and the carbohydrate a fixed one. As soon as this relationship is altered, the results are not so good. They believe that the favorable results are to be ascribed in part to the driving off of the volatile fatty acids from the milk fat; in part to the admixture of an amount of flour equalling that of the fat; in part to the chemical alteration of the flour produced by the browning which occurs during the preparation, and in part to

the low percentage of protein present, the last being particularly important in weakly infants.

The proportions recommended by them consist of seven grams of butter, seven grams of flour, five grams of sugar, and one hundred grams of water, to be mixed with varying amounts of milk, according to the age of the patient. These figures may conveniently be rounded off to, say, twenty grams of butter, twenty grams of flour, and fifteen grams of sugar in three hundred grams of water; but, as stated, the relationship of the butter to the flour must remain unchanged. In the actual process of preparation, twenty grams of butter are placed in a pan and heated over a gentle fire until foaming takes place, and until any odor of volatile fatty acids present shall have disappeared. This requires from three to five minutes. Twenty grams of fine wheat flour are then added and the mixture again boiled over a gentle fire with constant stirring until the mass becomes thin and of a brownish color (four or five minutes). Now three hundred grams of warm water and fifteen grams of sugar are added. The whole is again boiled, rubbed through a fine sieve, and then mixed with the desired amount of previously boiled, cooled milk, and the whole kept cold until needed for use. The addition of salt is not necessary, as this is contained in the butter. For children under three thousand grams in weight one third milk is added to two thirds of the butter flour mixture. For those of three thousand grams or over two fifths of milk and three fifths of butter flour mixture are employed. Not more than two hundred grams to the kilogram of body weight (i. e., about three fluid ounces to the pound) should be given daily, and usually smaller amounts than this are required, owing to the high caloric value of the food. At the time of their report forty infants had been fed in this way, of an age varying from less than one month up to six months. Twenty-one children had a weight of three thousand grams or less. The results were surprisingly good, and the gain in weight and length was excellent. There was no meteorism; the stools were yellow and of salvelike consistence, usually acid, and numbered one to three daily; sometimes three or four, yet without any harmful effect. Any previously existing disposition to vomit was not increased, and those who had not vomited earlier did not show any tendency to begin it. Increase in weight did not always commence at once, but would do so presently, and then went on rapidly with but little interruption, resembling greatly the gain in weight in healthy, breastfed children.

The improvement in general appearance and condition of the infant was particularly striking. This was in sharp contrast to that of other infants who had been fed successfully by other methods. The improvement was especially noteworthy in the development of fat in the lower parts of the body. Naturally not all of the infants did well, but the success in general was greater than with any other method of feeding which the writers had previously employed. All the patients were subjects of malnutrition when treatment was commenced, and many had had chronic nutritional disturbances following the early employment of different sorts of artificial

nourishment, or as a result of infection of some kind. The results were particularly good in weakly and premature infants in the first three months of life, weighing less than three thousand grams. If any dyspeptic disturbance was present, they delayed with the beginning of the food until there was at least a subsidence of the symptoms to some extent; but waiting for a complete restitution to health was not in their experience necessary.

In a somewhat later article, Kleinschmidt (12) describes the later experience of Czerny and himself with the butter flour food. They had tried it now even in infants a few days old and in those weighing less than two thousand grams, and found that under these circumstances it was better to employ at first a mixture in which the seven per cent. of butter and flour was reduced to five per cent., and the five per cent. of sugar to four per cent. Later the strength of the original composition may be employed, but this should always be considered the maximum. So, too, in infants who have not quite recovered from a condition of vomiting or diarrhea, or in whom for any reason there may be some doubt about the advisability of giving the food, it is well to begin with the weaker mixture.

The results of Czerny and Kleinschmidt's experiments were so encouraging that confirmation was sought by numbers of other clinicians.

Berend (13) employed the butter flour mixture in a number of cases. He thinks this food is a positive proof of the teaching of Czerny regarding the injury which may be done by fatty acids. Circumstances compelled him to use cooking butter almost spoiled, but the results were good. It sometimes takes a week or more before increase in weight commences.

Rietschel (9) showed by repeated trial the superiority in the very young and underweight subjects of fat mixtures as compared with those of milk, cereal and sugar, containing but little fat. He had very successful results with the Czerny-Kleinschmidt food modified to a certain extent.

Ochsenius (14) gave the butter flour mixture in 203 cases, always maintaining the relationship of butter to flour which had been insisted upon, but varying the proportion of the sugar to some extent. He completely confirms the claims made for the favorable action of the diet.

Stolte (15) tried the food thoroughly and fully agrees with the claims that it is especially useful in young and in premature infants of low weight. An important element is that it supplies enough nourishment; which is frequently not true of other food preparations. Its employment may be continued indefinitely. His metabolism experiments are of particular value, showing, as they do, that in spite of the comparatively small amount of nitrogenous material given, there was a positive nitrogen balance in every instance in which the tests were made. The high percentage of sodium chloride in the food, coming from the salted butter, appears to produce no disturbance in the water of the tissues.

Türk (16) tried the butter flour in sixty infants. His results were good on the whole, although there were eight who failed to thrive.

Thiemich (17) used it in about eighty cases with

very favorable results. He corroborates Czerny and Kleinschmidt in practically every detail. He refers to the belief that a diet rich in fat will make symptoms of the exudative diathesis worse, but did not find this to be the case with the employment of the mixture.

Friese (18) fed seventy infants with the butter

employed them in thirty-one cases with excellent effect. As already stated, he does not believe that the existence of volatile fatty acids has anything to do with the great advantage of the food, inasmuch as in his preparations he took no pains to dispose of these. He found the diet very useful in atrophic babies, and good in persistent cases of regurgita-

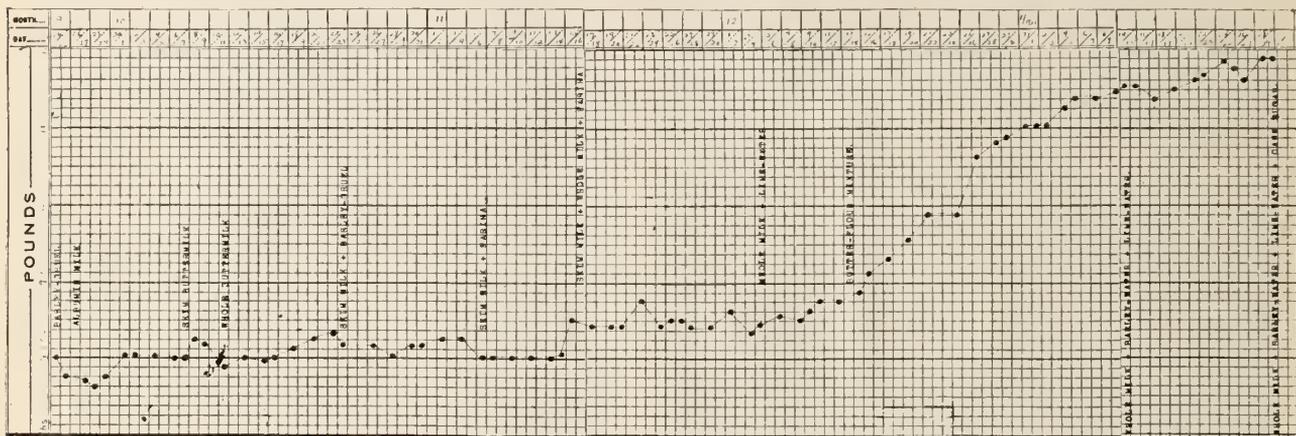


FIG. 1.—Weight chart of the Children's Hospital of Philadelphia. Case R. J., aged three weeks; admitted September 24, 1920.

flour food with results for the most part good, and he regards the formula as a great advance in infant feeding. Some experiments in which the butter was cooked but the flour not produced bad results, an indication that the browning of the flour is important.

Langstein (19) has in his own experience confirmed the value of the butter flour food in a large number of weakly infants who had not advanced

tion and vomiting; but does not think it suitable for the newborn. He agrees with Czerny and Kleinschmidt that there must be a certain fixed relationship between the fat and the carbohydrate, which should approach that present in human milk; viz, 1:1.7; and insists that it is important for success in infant feeding that fat should be present in sufficient quantity.

Bessau (7) found repeatedly that in the prepara-

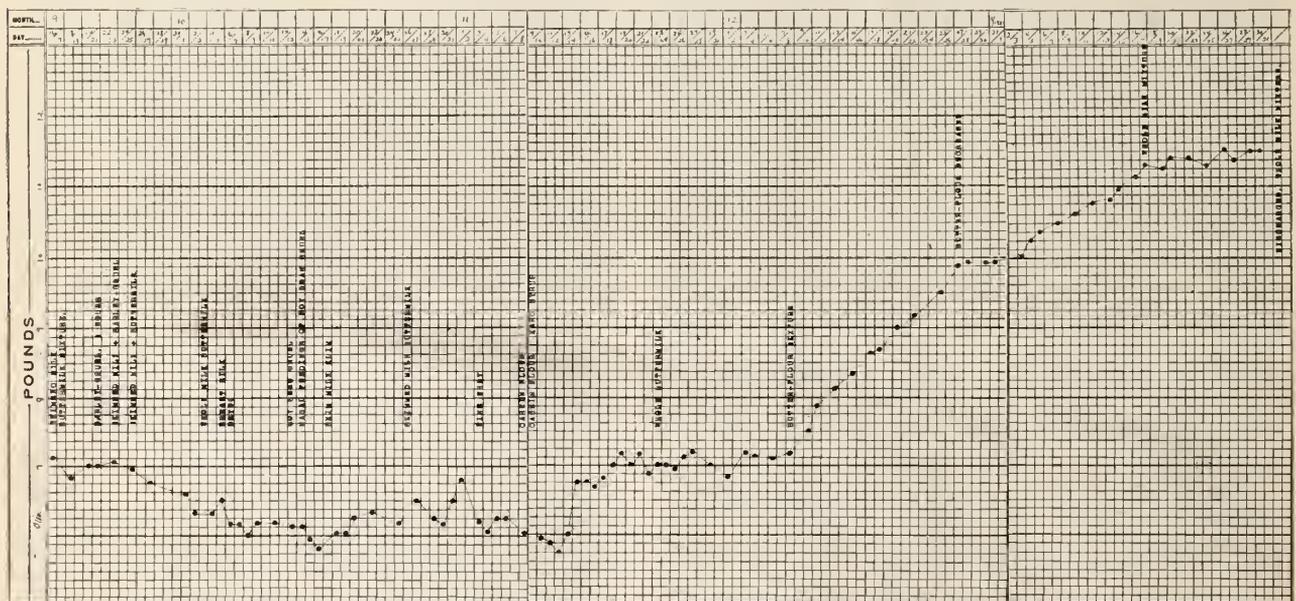


FIG. 2.—Weight chart of the Children's Hospital of Philadelphia. Case R. L., aged three months; admitted September 16, 1920.

with other methods of feeding. There may be, of course, bad as well as good results. He questions whether the value of the food depends upon the driving off of the volatile fatty acids.

Moro (8) prepared two formulae, based on the Czerny-Kleinschmidt butter flour mixture, and em-

tion of the butter flour mixture it was of the greatest importance to brown the substance.

Plantenga (20) used the food in thirty-one cases, with excellent results in most instances. He found, as did others, that some cases of eczema were benefited by it, these being clearly instances where that

disease depended upon defective nutrition. Some others were made distinctly worse, these probably being instances intolerant to a high percentage of fat.

Friedberg (21) employed butter flour in seventy-two cases and found it very efficacious in most of them. He reports some bad results, some of which he admits were not to be attributed to the food, while in other cases he would hold it responsible. In some of the patients who did badly it seemed sufficient merely to reduce the amount of sugar in order to obtain a good effect. He emphasizes the fact that proper judgment must be used in the selection of cases suitable for this nourishment, and with this, of course, all will agree.

Niemann and Foth (22) gave the food to sixty-two infants, and failed to get good results in only

and of the condition of the stools must be made before selecting butter flour in preference to other methods of feeding, and it is better to begin tentatively with smaller percentages of fat and carbohydrate. He found the results excellent in the exudative diathesis. It appears, too, useful for the prevention of rickets.

Beck (24) tried the butter flour food in twelve cases, but with a modification of the original formula. He found the mixture useful where there had been no prolonged digestive disturbance which was followed by an intolerance for fat.

Oertel (25) also reported on twenty cases in which he had used a modification of the formula, employing buttermilk instead of whole milk. His results appear for the most part to have been good.

Goett (26) tried the mixture in fifty-five cases,

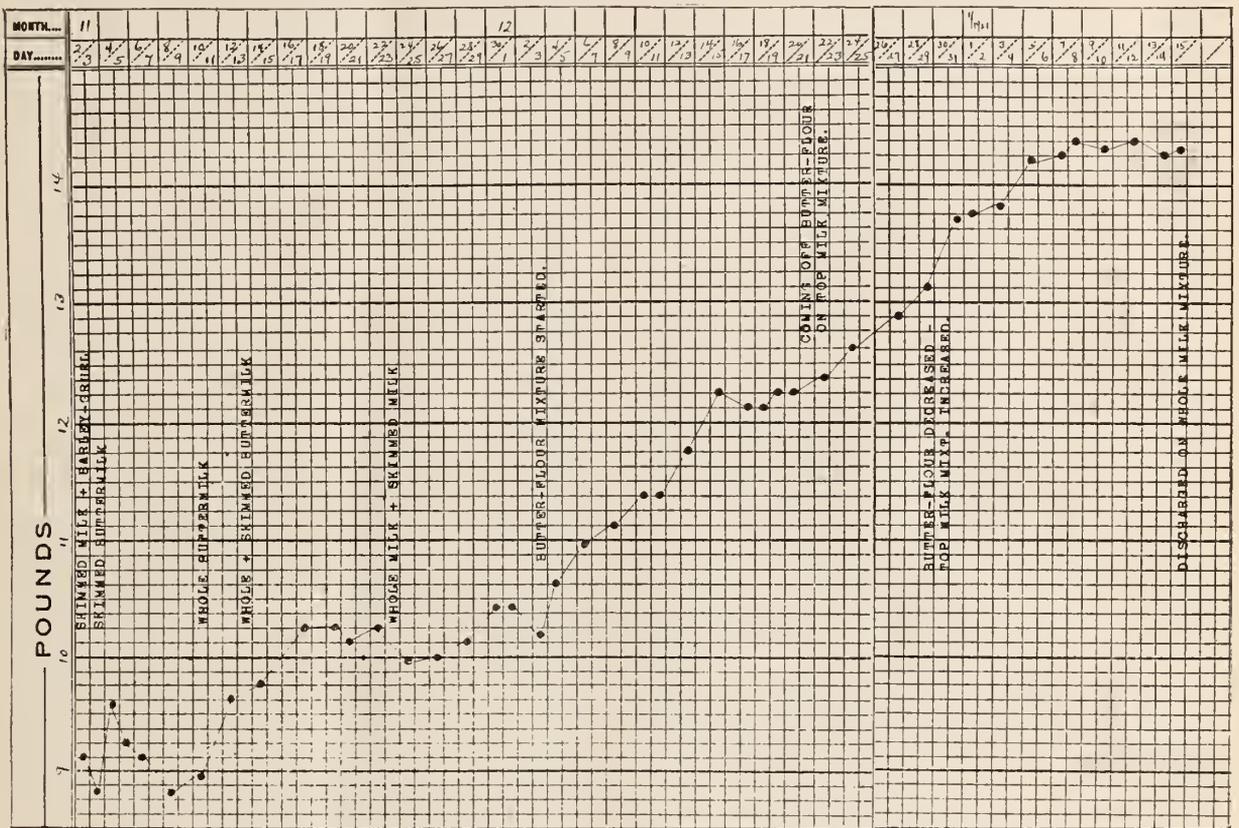


FIG. 3.—Weight chart of the Children's Hospital of Philadelphia. Case J. H., aged nine months; admitted November 2, 1920.

seven instances. They, too, urge the necessity of judgment in the selection of the cases, finding it unsuitable in acute diarrheal disturbances, in which all fat foods act badly. They, as do others, emphasize the importance of not giving too much, two hundred grams daily to the kilogram of body weight being the extreme maximum.

Reinach (23) has used the mixture in one hundred and twenty children who were either healthy or suffering from some nutritional disturbance. He found it useful in young healthy infants, combined with feeding from the breast. For premature infants and those with congenital asthenia exclusive breast feeding is to be preferred at first. In the case of those with subacute and chronic nutritional disturbances a careful study of the previous history

and found it especially useful in children much under weight when combined with breast milk feeding. He also found it of service in older children in combination with malt soup feeding.

Pfandler (27), in discussing Reinach's paper, referred to the fact that among the Tyrolese peasants it had been the custom for many years to employ a browned flour gruel (*Brennsuppe*) for the feeding of infants.

Timm (28) fed forty infants with the mixture and considers it a valuable food. He agrees with others in stating that it is not suitable for all cases of infants with nutritional disturbances.

Oswald (29) used the butter flour mixture for forty-five infants of whom seventeen were premature. In some of them the results were remark-

able, and only comparable to the use of human milk. He has had only one bad result, and thinks the food is a very valuable one.

Feer (30) stated that he had given the food in numerous cases with excellent results, particularly in the delicate, poorly nourished infants. He had seen rickets develop under its administration, but this is equally true of other methods of feeding.

Wieland (31), in discussing Oswald's communication, stated that there was no question about the favorable results which could be obtained, but he warned against considering it a perfect food which was suitable to replace human milk.

Reber (32) found the mixture unsuitable in severe cases of dyspepsia with rapid loss of weight and toxic symptoms, but had good results in other conditions, especially in disturbance of balance, atrophy, and decomposition.

Rhonheimer (33) points out that the Czerny and Kleinschmidt diet was not intended for a food for acute severe dyspeptic disturbances, but to be given only during or after recovery had commenced; and he thinks that in forming any judgment of its value, the directions for preparation given by the authors should be strictly followed, and the selection of cases also, as indicated by them. Its administration should be begun cautiously in the doubtful cases during recovery from severe digestive disorders. He says that the diet does not prevent the development of rickets, but that no one has ever said it was equal to nourishment with human milk.

Jacki (34) reports an epidemic of dysentery occurring in a number of infants fed upon the butter flour food, this being traced to contamination probably from a nurse infected by the disease. She thinks that final sterilization should be employed. This experience, of course, does not militate in any way for or against the value of the food.

Müller and Brandt (35) compare the composition of the butter flour mixture with the older fat mixtures of Biedert, Backhaus, and Gärtner. They modified the old ones by the addition of browned flour, but omitted the driving off of the volatile fatty acids by heat, and found by clinical experience no essential difference in the result. They feel that the butter flour food is a return to the old fat milk mixtures.

Wolff (36) tried the food in a number of cases, with excellent results, and corroborates the statements of Czerny and Kleinschmidt in every detail. He had good results in one case with symptoms of pylorospasm. He found it beneficial also in some cases in children of from two to four years with malnutrition.

The only unfavorable report appears to be that by Rosa Lange (37), who employed the food in thirty-four infants. While admitting the good results obtained by others, her own were not very satisfactory, there being more failures than successes. This can only be explained partly on the ground that a number of modifications of the Czerny-Kleinschmidt mixture were tried, not such as were proposed by the original describers, and chiefly because, as she admits, the clinical material was of a particularly unfavorable nature, many of the cases being evidently clearly unsuited for this form of

nourishment, if one follows the indications outlined by Czerny-Kleinschmidt. She speaks of what appears to be the unnecessarily high caloric value of the food, but found that a decided dilution of it was accompanied by continued loss of weight. Mixtures in which buttermilk replaced the milk were equally, for the most part, without good result.

Our own experience with the butter flour mixture covers its employment in the feeding of thirty-two infants. We have, for the most part, followed the technic of preparation given by Czerny and Kleinschmidt, and the amounts of the ingredients which we have usually employed consist of butter twenty grams, flour twenty grams, sugar fifteen grams, and water three hundred grams. Emphasis should be placed upon the necessity of following closely the method outlined by the German authors, especially in the browning of the flour. For convenience in making the mixture in the home we have estimated the various amounts of the ingredients in tablespoons. Thus it is sufficiently accurate to use two level teaspoonfuls of melted butter, two and one half level tablespoonfuls of flour, and one and one half level tablespoonfuls of sugar to ten fluid ounces of water.¹ All those who have used the food are insistent that the butter and the flour should be maintained in the correct ratio; that is to say, that in whatever manner the mixture may be modified, the amounts of butter and of flour should remain equal. If this caution is observed many different strengths of the mixture may be employed. Indeed, we found it of considerable advantage in certain cases to reduce the amounts of butter and of flour to less than twenty grams each to three hundred c. c. of water. In infants in whom there was evident fat intolerance, or who were convalescing from a severe intestinal infection or indigestion, the mixture could be started earlier than could otherwise have been done if only ten grams of butter and ten grams of flour were used with three hundred c. c. of water. The amounts of these two could be increased later. In some cases the sugar should be decreased in amount or omitted entirely. Again, one to three feedings of butter flour mixture a day were sometimes given as substitutes for the ordinary cow's milk mixtures which constituted the other feedings; and we have occasionally alternated it with breast feedings, as has been successfully done by others.

Czerny and Kleinschmidt recommended, as we have stated earlier, that in young infants and in those in whom the body weight is under three thousand grams (six and one half pounds) a mixture should be made of two thirds of the stock solution with one third of milk; in older infants three fifths of the stock solution with two fifths of milk. Other proportions of stock solution and of milk may, however, be employed at discretion. In certain cases we found it preferable to use skimmed milk in place of whole milk. In other words, it is quite simple to manipulate the percentages of fat, carbohydrate and protein in this food as the indications

¹We wish to express to Miss B. L. Mamby of the Children's Hospital of Philadelphia our appreciation of her care and interest in the preparation of the butter flour mixture, her determination of the measurement equivalents, and her preparation of the weight charts which accompany this communication.

arise, always, however, maintaining the fixed relation of the butter to the flour.

We attempted to determine the percentage strength of the elements of the mixture as finally given to infants, but encountered some difficulties. In the calculations the substances used were considered to have the following ingredients (38):

	Fat percentage.	Carbohydrate percentage.	Protein percentage.
Butter	85.00	0.00	1.00
Flour	1.40	76.40	7.90
Sugar	0.00	100.00	0.00
Milk	4.00	4.50	3.50

Using these figures as a basis the stock solution should contain about 5.75 per cent. of fat, ten per cent. of carbohydrate and 0.5 per cent. of protein. Analysis of this stock solution after it had been cooked was kindly made for us by Dr. Leon Jonas, of the Pepper Medical Laboratory of the University of Pennsylvania. This showed that the fat percentage as calculated was too high, and that the stock mixture contained only about five per cent of fat, owing to the loss of the volatile fatty acids by evaporation. Inserting this correction, one fluid ounce of the stock solution may be said to represent 26.6 calories. Based upon Dr. Jonas's analysis, the mixture containing two thirds of the stock solution and one third milk may be estimated as representing approximately fat 4.6 per cent., carbohydrate 8.2 per cent., and protein 1.5 per cent., with a caloric value of 24.6 to the fluid ounce. That containing three fifths of the stock solution and two fifths of milk similarly contains 4.6 per cent. of fat, and 7.8 per cent. of carbohydrate and 1.7 per cent. of protein, with a caloric value of 24.3 to the fluid ounce. Calculation of other strengths of the stock solution and of various mixtures with milk may readily be made.

Some of the probable reasons for the favorable results following the use of this combination of butter, flour, sugar and milk in infant feeding have already been pointed out. Mention should be made again of the form of fat supplied in this food. To say that there is a biological difference between human and cow's milk does not satisfactorily explain the fact that an infant whose digestion will tolerate a certain amount of human milk fat will not necessarily bear an equal quantity of fat from the mammary secretion of another animal. The most important difference which chemistry has shown us in the composition of the fat of human milk and of cow's milk, respectively, consists in the greater proportion of volatile fatty acids in the latter. In human milk these acids (butyric, caproic, caprylic and capric) constitute about two or three per cent. of the total fat, while in cow's milk they are present in several times that amount (39). In milk the volatile fatty acids are in combination as glycerides, and in this form are not liberated unless heated to over 275° C. The acids themselves, however, are soluble in hot water and can be distilled with steam at normal atmospheric pressure (40). In butter the volatile fatty acids must be present in looser combination than as glycerides, or may even occur as uncombined acids, because they are readily driven off by cooking. Their odor is easily recognized when butter, and especially ran-

cid butter, is heated to the point where it bubbles. Furthermore, Dr. Jonas found that the fat of the stock solution after cooking consisted entirely of neutral fat, and that no trace of fatty acids was discoverable. Whatever, then, may be the cause of the good results produced by the butter flour mixture, and whatever the relationship which the volatile fatty acids may bear to this, it is at least certain that the results are good and that in the food as prepared by Czerny and Kleinschmidt these volatile fatty acids have been removed.

We have, as stated, fed thirty-two infants with the butter flour mixture. For the most part the cases have been selected from among those infants who had not seemed to thrive when fed with the more commonly employed simpler modifications of cow's milk. These were the infants whose digestive capacity did not permit them to metabolize sufficient fat, carbohydrate and protein, as ordinarily offered them, to produce a satisfactory gain in weight. Such a condition is variously diagnosed as gastrointestinal indigestion, malnutrition, disturbance of balance, or dyspepsia, depending upon the nomenclature adopted and the severity of the symptoms. We found that the mixture, like other foods, had its indications and contraindications, and that the success of feeding depended upon the proper selection of the cases. There are certain digestive disturbances which appear to contraindicate the employment of the food. Thus, when from any cause there was considerable diarrhea or a sudden distinct loss of weight, or the intestinal derangement was one accompanied by fever, the Czerny-Kleinschmidt mixture not infrequently appeared to aggravate the symptoms. The severer forms of malnutrition, where the tolerance for any form of food is low, may grow decidedly and rapidly worse when butter flour mixture is used. The food should be given cautiously, if at all, to infants suffering from infantile atrophy (athrepsia, decomposition). Other conditions which might not be expected to respond favorably to it nevertheless did so in certain instances. Among these may be mentioned some cases of eczema and certain instances of gastrointestinal indigestion in which vomiting was a marked feature. Contrary to the experience of some of the investigators we found pyloric stenosis benefited by the butter flour mixture in two instances. We found, however, that it was the infant whose low body weight was due to a failure properly to metabolize sufficient cow's milk fat who responded most favorably to the Czerny-Kleinschmidt food.

In spite of the high fat content of the butter flour mixture vomiting seldom occurred. Of our thirty-two infants in only two did vomiting follow as a marked symptom. Neither of these responded favorably to butter flour feeding. Nine infants vomited once or twice during the first two or three days on which they received the mixture; but five of these nine had previously been vomiting foods more than they subsequently did the butter flour. Four infants who had been suffering from repeated vomiting stopped this when they were given the new preparation. Two of these were the babies already referred to with distinctly visible gastric peristaltic waves, one of whom had been fed unsuc-

cessfully upon breast milk supplemented by a cow's milk mixture, and the other upon a corn syrup and buttermilk combination.

The stools of the infants taking the food were rather characteristic. They were of a light yellow color, resembling more the canary tint of the breast-fed baby's stool than they did that of the stool of the infant receiving cow's milk. The odor was not offensive, but was somewhat aromatic. In consistency the stools were soft, and at times lumpy rather than smooth. Mucus was seldom present, although a shiny appearance resembling it was not uncommon. Under the microscope starch was almost invariably found, and it could also be demonstrated by the iodine test. The usual impression received when employing the method recommended by Morse and Talbot (28) was that about one half of the fat of the stool was present as a soap, and that the remainder was equally divided between neutral fat and fatty acids. Occasionally the last two were not found under the microscope. The stools were acid in reaction, but apparently not excessively so, and it was only infrequently that the buttocks became irritated. In number the movements varied from one to three in twenty-four hours, and even infants who were doing badly on butter flour feeding did not have more than five stools a day.

The gain in weight in infants who thrive upon the butter flour food is usually satisfactory and often really wonderful. We exhibit three illustrative weight charts which speak for themselves. Although Czerny and Kleinschmidt state that the gain did not begin at once, it has been our experience that the favorable influence on weight was shown very promptly, and that after twenty-four hours of butter flour feeding infants, whose weight had been previously stationary or decreasing, started to exhibit a steady increase in weight which continued as long as the food was used. The average gain on each day was about one and a half ounces. Some of our patients gained in weight so rapidly that the result, at the beginning, could only be explained on the theory of water retention. Thus one baby gained seven ounces over the first night, and another twenty ounces in six days. The majority of our patients received the butter flour mixture for a month or longer. The greatest length of time during which we have used the food in any individual case was forty days, in which time the baby gained fifty-four ounces. The stopping of the butter flour diet was usually done simply because the progress had been so excellent that it appeared time to send the infant to its home. In some of our later experiences we have had the mothers taught by the nurse how to prepare the food in their own homes—a matter which did not seem to be at all difficult for women with average intelligence.

The amount of the mixture fed to the infants depended on their age and weight, and did not differ materially from that commonly employed with other foods. Czerny and Kleinschmidt and other German clinicians recommend that from one hundred and twenty to two hundred grams of the food should be given daily for each kilogram of body weight (one and three quarters to three fluid ounces to the pound). In our own cases we often exceeded three

ounces to the pound without deleterious effects. From seventy-five to ninety calories of the food to the pound of body weight a day were usually required in our cases. In one instance from one hundred and ten to one hundred and twenty calories were well tolerated for the month. Occasionally satisfactory gain occurred when but sixty calories to the pound of body weight were given daily.

Two symptoms were observed in the babies while taking the new food, which were so noticeable as to be worthy of remark. Without offering any explanation of these phenomena, it may be stated merely that sweating was present in almost all the infants, and, as a consequence of this, sudamina developed. This latter symptom was so constant that it was spoken of in the hospital as the butter flour rash. The sweating and the rash have not been mentioned by other authors, so far as we know. That the sweating had nothing to do with the development of rickets, is evidenced by the fact that no other symptoms of this condition made their appearance. It may be stated, too, that observers in general have seen no tendency to any special inclination to the development of rickets in infants fed upon this diet.

The removal of babies from butter flour feeding is not a procedure to be accomplished quickly. We have not been successful in suddenly stopping it and at once substituting all the feedings with an ordinary cow's milk mixture containing a high fat percentage and a strong cereal decoction. When this plan was attempted diarrhea and vomiting and consequent loss of weight frequently developed. If, however, a weaker cow's milk mixture made with a barley water diluent was used, such, for instance, as one containing fat two per cent., carbohydrate six per cent., and protein two per cent., one bottle of this substituted for one of the butter flour food, then in two or three days a second bottle, and so on, indigestion did not occur and gain in weight often continued throughout the transition stage.

The average age of the infants whom we fed on the new food was four months, the youngest being two weeks old and the oldest one year. The average weight at the beginning of the feeding was eight and a half pounds; the extremes being five and a quarter pounds and fourteen and a half pounds. Eight infants weighed each six pounds or less. Of the thirty-two infants to whom we fed the butter flour food twenty-three responded favorably. These patients not only gained weight, but also showed improvement in their general condition, in that the digestion was good, the turgor of the tissues increased, the maximum amount of sleep was obtained, and contentment and satisfaction with the food were notably manifest. Of the infants doing well on the mixture three had eczema, two pylorospasm, one was a cretin, and one a Mongolian idiot.

In analyzing the subsequent histories of the nine infants who did not improve upon butter flour feeding, it seems fair in seven instances to observe that the type of feeding was not in itself responsible for the failure. Thus one baby died suddenly two days after the diet was commenced, nasal diphtheria developed in one, and bronchopneumonia in one, while

one infant was suffering from tuberculosis of the lungs and bronchial glands, one from chronic basilar meningitis, one from congenital syphilis and hydrocephalus, and one from a low grade peritonitis due to a ruptured appendix. In one of the two remaining babies the food was contraindicated and should not have been employed, as the patient had been exhibiting fever, diarrhea, and rapid loss of weight. The other baby was a rather typical case of fat indigestion and improved at once when removed from butter flour feeding and given a skimmed milk mixture.

The conclusions to be drawn from our own experience and that of others are so obvious that it would appear unnecessary to formulate them at any length. The two great lessons which we are taught are, first, that when fed with the butter flour food infants may often tolerate fat in a manner which can be accomplished probably by no other means yet known to us; and, second, that the truly remarkable results which often follow are a strong proof of the great need which the infant's economy possesses for a food containing a sufficiently large amount of fat.

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1810 SPRUCE STREET.

Diagnosis of Summer Diarrhea*

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Nothing offers greater opportunity for difference of opinion than an attempt at a classification of intestinal disorders in early life. It would probably be difficult to find two pediatricists agreeing absolutely on any one selection.

Summer diarrhea may be considered as occurring in two main types, one due primarily to infection of the intestinal wall and the other due to a disorder involving the intestinal contents. If these basic distinctions are admitted, it will be agreed at once that hard and fast lines of demarcation between types often are difficult or impossible to draw and that mixed types are encountered not rarely.

The distinguishing feature of type one is that bacteria, usually introduced in food, drink or by contact with infected articles, invade the wall of the gut and set up definite anatomical changes. Type two may be viewed as a functional disturbance rather than a somatic disease, since the basic disorder involves the intestinal contents rather than the intestinal walls. It is an open question whether this disorder begins as a disturbance of digestion due to a perversion of normal digestive function resulting from the enervating effects of heat, physical exhaustion, or other cause; or whether bacteria play the most important rôle in inaugurating unusual forms of fermentation or by causing an excess of what may be called normal bacterial activity.

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The subject offers such intrinsic difficulties in its solution that a decision at the present time is impossible.

Infectious diarrhea has two chief synonyms, ileocolitis and dysentery. The latter term suggests an unvarying relationship to the *Bacillus dysenteriae*. Many attempts have been made to prove the agency of other types of bacteria, notably the gas bacillus, various forms of streptococci, and *Bacillus coli*, *Bacillus pyocyaneus*, and other bacilli. It is difficult to determine whether these organisms are primary or secondary invaders, so that no positive statement can be made as to the exact importance of any, except the *Bacillus dysenteriae*. Although hot weather, and especially the combination of heat, humidity and stagnant air, undoubtedly predispose to any of the diarrheal diseases, the infectious form is seen occasionally in cool weather. For example, a small epidemic of a mild type occurred during March, 1921, in the children's ward at the University Hospital, in which the *Bacillus coli* was the predominating organism. Ileocolitis also seems prone to follow other diseases, such as bronchopneumonia, or to occur in infants who have suffered from chronic intestinal indigestion and its consequent malnutrition. In typical cases the infecting organisms invade the wall of the gut early, causing infiltration of the mucosa. The inflammation spreads to the submucous layer and involves the solitary lymphatic nodules. The latter may break down and ulcerate, resulting in small punched out cavities. In other severe types the superficial infiltration may be followed by necrosis which leaves irregular ulcers. Secondary to the lesion of the bowel we find enlargement and congestion of the mesenteric lymph nodes and it is probable that bacteria may reach the blood stream by transfer to the thoracic duct from the mesenteric lymphatics. In this way can be explained secondary infections which sometimes occur in other parts of the body, such as bronchopneumonia. Since the disease is a systemic as well as a local infection we usually find parenchymatous degeneration to a greater or less extent in liver, kidneys and spleen. True nephritis rarely results.

The second or functional type of diarrhea probably depends more definitely upon atmospheric conditions than does the infectious type. Not only does heat exert its debilitating effect upon the child and especially upon the infant in its first year, but it also favors the development of various organisms in the food before it is consumed, such as those in milk and raw fruit. The direct agency of bacteria within the intestine, however, has never been placed upon a satisfactory basis and it is hard to avoid the conclusion that various types may act upon the food residue, but that defects in the mechanism of digestion have prepared the appropriate pabulum. It is also certain that the infant or child who has been subject to intestinal indigestion is especially prone to these functional forms of summer diarrhea.

Indigestion *per se* from carbohydrate or fat apparently explains many instances of moderate diarrhea occurring at any season, in which the special agency of bacteria cannot seriously be called into question. These do not belong to the category of

summer diarrhea although, when they occur in summer, there can be little doubt that they furnish ideal conditions for bacterial activity. In another class of cases, bacterial toxins are developed in the food, such as milk, before its consumption, and act as acute and virulent poisons.

The intestinal lesions in the functional form of diarrhea show a wide variation in intensity, but the chief change consists in a superficial catarrhal inflammation. It would seem that this is due, for the most part, to the irritation of abnormal or excessive products of fermentation, such as the lower fatty acids, rather than to the action of bacteria *per se*. Secondary involvement of the gut resulting in a true infectious diarrhea probably occurs quite frequently.

SYMPTOMATOLOGY.

This may be given in the form of a comparison by grouping, first, those symptoms which are more or less common to both types of diarrhea, and secondly, those which show material points of difference. It must be understood also that the usual differences in degree which are seen in mild, medium or severe cases, cause pronounced variations in the symptomatology.

Onset.—Both forms of diarrhea may be preceded by symptoms of indigestion, but as a rule, the onset in both types is sudden, at least during hot weather.

Toxemia.—Toxemia will be present in both types, depending upon their severity. As a rule, however, the patient with functional diarrhea will show a higher initial temperature and more severe toxic symptoms than are seen in ileocolitis. In the latter, toxemia increases at a time when the functional type begins to show improvement. The severe toxic cases of functional diarrhea show a suggestive facies, apathetic or stuporous, with dull, sunken eyes. In others there may be restlessness or even convulsions at the onset, but drowsiness or stupor soon follows.

Vomiting.—Vomiting is not as common in the infectious as in the functional type. In the former it usually occurs chiefly as an initial symptom, ceasing when the stomach and duodenum are emptied of food. In the functional type, vomiting may be severe and prolonged although it rarely persists throughout the attack and may be absent entirely.

Anorexia.—Anorexia is common in both types but usually is more pronounced and protracted in the infectious diarrheas.

Prostration.—Prostration at first depends upon the severity of the toxemia and of the diarrhea and vomiting. It is likely to be more severe at first in the cases of functional diarrhea; later it is equally well marked in the infectious type. As an index to the degree of actual prostration the pulse usually is a reliable guide. It may be reiterated that a distinguishing feature between the two types of diarrhea is that in general the functional type tends to an acute course with recovery or death, while infection of the intestinal wall speaks for chronicity.

Restlessness.—As an early symptom restlessness depends upon toxemia as well as upon abdominal pain. Later we may expect to find it chiefly in the infectious type in which the intestinal lesions are more provocative of hyperperistalsis.

POINTS OF DIFFERENCE.

The characteristics of the diarrhea itself furnish the chief diagnostic points of difference. For the first six to twelve hours both types are likely to show merely a rapid emptying of the gut with more or less evidence of indigestion with serous transudate. There usually follows, in the functional type, marked flatulence with a variegated type of stool, six to twelve or more a day, of foul odor, usually acid in reaction, and often causing irritation to the skin of the buttocks. The offensive odor often ceases by the second or third day and mucus appears. In favorable cases with suitable treatment convalescence begins at this stage, and may be complete within ten to fourteen days or sooner. In debilitated or very young infants death may come in two or three days. In others the acute attack may be succeeded by chronic intestinal indigestion or a secondary ileocolitis. The ultimate mortality in such cases in hot weather is extremely high.

In infectious diarrhea, after the initial emptying of the bowel, the stools become more frequent and less copious, consisting chiefly of mucus, epithelial and bacterial detritus intimately mixed with varying amounts of blood, which is darker in color than fresh blood. The reaction often is alkaline. Preceding each stool usually there is abdominal pain, and the rectal tenesmus during and after the stool is one of the most characteristic symptoms. In mild cases the blood may almost disappear after a few days but an excess of mucus continues throughout the acute stage. In severe cases blood persists for a longer period. When ulceration of the follicles occurs, after the acute stage of congestion has passed, the stools become less frequent, dark brown or green in color, with offensive odor. Blood is seen occasionally but not in large amounts. Mucus or mucopus is always present and, microscopically, large numbers of round cells can be seen.

To sum up, in functional diarrhea flatulence and foul odor to the stools are early symptoms but the number of stools soon tends to diminish and blood is seldom seen. Abdominal pain occurs at first but is not a symptom of major importance. In ileocolitis the stools consist in large part of mucus, and the odor may not be especially offensive. Frequency is marked and persistent, blood is a characteristic finding, while abdominal pain and rectal tenesmus are present in a majority of cases.

Fever.—In both forms there is an initial rise of temperature which may be higher in the functional type but in the average case soon tends to fall and assume a slight or moderate irregular range. In severe cases fever may persist and in others a recurrence is often seen before death. In ileocolitis, on the other hand, fever is constant throughout the active stage, tending to range between 100° and 102° or more for at least ten days, and, in protracted cases, simulates the temperature of typhoid fever.

Dehydration.—In every case of severe diarrhea with rapid loss of weight there follows to a greater or less degree the condition known as dehydration. In this there is a diminution of the blood volume with increased viscosity, a retardation in the flow of blood in the peripheries, stagnation of the red cor-

puscles in the capillaries, and an increased concentration of solids in the blood serum (increased refractive index).

Marriot believes that all of these symptoms can be explained in large part on the basis of a severe water loss from the body. Clinically, the skin and subcutaneous tissues give every evidence of dryness. The diminution in the output of urine, which always occurs, probably explains in part the secondary symptoms of intoxication which occurs *pari passu* with the dehydration. Acidosis at times is another factor in the production of the toxic state. The dehydration and toxemia are likely to be more marked in the functional than in the infectious type of diarrhea, because the water loss usually is greater in the former type. This forms additional evidence in favor of Marriot's contention.

Two rare special forms of diarrhea may be described, as follows:

Membranous colitis.—This form of ileocolitis usually resembles the severe forms of functional diarrhea in the sudden onset, marked toxemia and high fever. The stools are watery at first but blood appears early and abdominal pain and tenesmus are pronounced, the latter often leading to prolapsus ani. On the wall of the prolapsed gut sometimes can be seen patches of pseudomembrane, and the stools may contain shreds of it. In some cases there may be slight constipation at the onset so that the toxic symptoms, vomiting, delirium and stupor, may simulate meningitis, and the true nature of the attack may be masked. Sometimes death may follow before diarrhea sets in.

Cholera infantum.—Cholera infantum, a form of functional diarrhea, usually is given a separate place because of its special characteristics. As a rule it occurs in babies who have been suffering from chronic intestinal disorders. The first symptoms are prostration and fever, soon followed by severe and protracted vomiting and a profuse watery diarrhea. The stools are as frequent as in the worst cases of ileocolitis but, after the initial emptying of the gut, consist of serous transudate rather than mucus. The reaction is acid at first but soon becomes alkaline. Tenesmus is rarely seen, and as the disease progresses the fluid runs from the bowel without any control by the sphincter. The abdomen is sunken. Tenderness and rigidity of the walls are lacking. In such cases dehydration of the tissues occurs early and becomes extreme and the loss of weight is shockingly rapid. The urine is scant, highly acid, and usually shows albumin. Death occurs in stupor, often within forty-eight hours of the onset.

Because of the excessive loss of fluid from the bowel, and the absence of any signs or symptoms of a severe inflammation or congestion of the intestinal mucosa, it has been suggested that cholera infantum may be a form of general toxemia rather than a specific affection of the intestinal tract. If this is true the loss of fluid evidences the attempt of the organism to eliminate systemic toxins rather than to get rid of a local intestinal irritant.

DIAGNOSIS.

Summer diarrhea usually does not offer any difficulty in diagnosis except in the attempt to differen-

tiate its two forms. Several other conditions must always be remembered, however, as a failure to recognize them may have most serious consequences.

The appearance of blood in the stools in early life, but especially in infancy, should always suggest the possibility of intussusception. If vomiting and abdominal pain or discomfort are present and if enemas bring only mucus and a small amount of fecal matter, intussusception becomes the most probable diagnosis. Confirmatory symptoms are the absence of fever and the presence of a sausage-shaped tumor, usually in the right iliac fossa. At times the tumor can be felt best by rectal examination.

The presence of vomiting also should always suggest the possibility of meningitis, which often begins with a moderate diarrhea. Pneumonia, pyelitis, and even otitis media also may be ushered in with gastrointestinal disturbances. In all of these diseases, however, the diarrhea rarely is severe enough to cause confusion with ileocolitis or functional diarrhea, and the characteristic symptoms of each disease usually are conclusive. Typhoid fever may simulate ileocolitis but again the diarrhea of the latter usually is much more severe than in typhoid.

Poliomyelitis in the preparalytic stage not rarely is diagnosed as enteritis and even more frequently in the abortive forms. From careful observation and the results of lumbar puncture it should be possible to reach a conclusion, although, in the absence of an epidemic of poliomyelitis, the decision is not always easy to make.

The relation of diagnosis to treatment rests upon the determination of three factors; a, involvement of the intestinal wall with a more or less specific type of organism; b, perversion of digestion in conjunction with more or less bacterial activity, and c, dehydration of the tissues. In the first, specific treatment may be tried but diet certainly plays a much less important rôle than in the second class. In the latter, dietary treatment is of extreme importance. If a predominating type of organism can be determined, the attempt can be made to secure a

change of intestinal flora by dietary procedure.

The occurrence of the third factor, dehydration, even in mild degree, at once gives an imperative indication for treatment. In the presence of a severe diarrhea, even before dehydration can be recognized clinically, appropriate measures for prevention should be inaugurated. Particularly is this true of infants whose nutrition has been retarded as a result of previous indigestion or other illness.

An analysis of one hundred cases of summer diarrhea at the Children's Hospital showed that thirteen were of the infectious type and eighty-seven of the functional type. The onset was recorded as sudden in every case in which the history was complete. Vomiting occurred as an initial symptom in sixty-nine per cent. of the infectious cases and seventy-one per cent. of the functional cases. Blood was present in the stools in all the infectious cases and to a slight degree in only eight per cent. of the functional cases.

Considering a maintained average temperature of 101° F. as febrile, fever was present in all of the infectious cases and in twenty-six per cent. of the functional cases; of the latter twelve and four-tenths per cent. only showed a rise immediately preceding death; bronchopneumonia was the cause of the fever in three and four-tenths per cent. and in nine per cent. the fever barely exceeded 101°. In only one case, therefore, was there any pronounced and protracted fever without demonstrable cause other than the intestinal affection.

The mortality was sixty-one per cent. in the cases of colitis and twenty-four per cent. in the functional types. Not directly connected with the subject, but of interest, was the average number of days that the patients had been sick before admission, twelve and one half days in the infectious type and eleven in the functional. In only one fifth of the total number were the patients brought to the hospital on or before the third day of the disease. This may explain in part the excessive mortality in hospital cases.

Use and Abuse of Drugs in Summer Diarrhea*

By JOHN F. SINCLAIR, M. D.,
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To clear the way for the presentation of the first part of the title of this article, i. e., the use of drugs, let us at the very beginning consider the latter part of our subject, the abuse of drugs.

The drugs which have been most grossly misused are undoubtedly the laxatives, especially castor oil and calomel. These are of undoubted value when properly employed in appropriate doses, as an initial laxative, at the very beginning of a gastrointestinal attack, but when they are administered again and again, often every second or third day as is frequently the custom with some physicians, they unnecessarily deplete the system of the water and

mineral salts in which it stands greatly in need and weaken rather than support the bodily defenses.

Furthermore, in those cases which are first seen late in the attack after gastrointestinal disturbances have progressed beyond the acute stage, it is frequently ill advised to administer either castor oil, calomel, or other laxative, for the reason that the baby cannot survive if the reserves of water and salts are still further and rapidly depleted. In the case of castor oil it is also true that it tends to produce vomiting and that large or frequently repeated doses may cause sufficient irritation of the intestinal mucosa to bring about the appearance of blood in the stools quite apart from any inflammatory condition which may exist then or subsequently.

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Next to the laxatives the greatest misuse or abuse of a drug is in connection with the administration of opium. On the one hand, the laity and certain physicians press the use of opium, usually in the form of paregoric, to such limits, that it is not infrequent in hospitals with infant wards to receive patients who are suffering from unmistakable opium poisoning. Probably, however, the more frequent error is in withholding opium altogether when proper doses would allay excessive peristalsis and relieve pain. Excessive peristalsis accompanies and causes the very frequent diarrheal stools, while lessening peristalsis puts a stop to the loss of water and mineral matter. The main indications for the use of opium then are to stop excessive peristalsis and to relieve pain. The main contraindications to the use of opium are found in an intestinal tract which has not been completely evacuated, in infrequent and foul stools, in the early stages of acute cases, and in those cases accompanied by high temperature, cerebral symptoms, and scanty elimination. It is a valuable drug when properly employed at the proper time and in the proper place. It has, however, been frequently used unwisely.

Turning now to the use of drugs in summer diarrhea, presupposing an infant with a gastrointestinal disease, how shall we proceed in so far as the administration of drugs is concerned. The diagnosis is of first importance. What are we dealing with? An irritation, probably largely mechanical, of the digestive tract, or, is it an inflammation of stomach and bowels? If the former, what should be the plan of action?

Where the symptoms and signs point to an irritation rather than to an inflammation of the intestinal tract the procedure is simple. A prompt and energetic use of castor oil, one to four drams according to the age of the child, or calomel in divided doses from one tenth to one quarter of a grain at intervals of one half hour to one hour, until a grain has been given, followed by calcined magnesia, five to thirty grains, or milk of magnesia, half a fluidram to two fluidrams, is indicated and this medication should be followed by a period of temporary starvation. In the great majority of cases in which there is only the irritative or mechanical factor the patients will respond promptly to this simple mode of medication. Occasionally, either the subcarbonate or the subgallate of bismuth may be required for a short period in doses of ten to twenty grains every three hours, or dram doses of chalk mixture every two hours may suffice.

The inflammatory or infectious types are unfortunately not always so readily amenable to treatment. Here in the acute cases the preliminary use of castor oil, or calomel followed by magnesia, is indicated and should precede brief periods of starvation as has been described above.

In the milder of these cases chalk mixture may be employed with advantage while the more severe cases call for the administration of bismuth subcarbonate or subgallate in full doses. If these cases do not promptly show an abatement of the diarrhea and especially if there are evidences of excessive peristalsis and pain, opium in the form of camphorated tincture five to fifteen drops, Dover's powder,

half a grain, or deodorized tincture is indicated. In the case of marked tenesmus the starch enema with five to ten drops of tincture opii to the ounce of starch water is usually efficient in relieving this distressing symptom.

If the inflammation is severe and extensive and the patient has difficulty in combating the infection it may become necessary to resort to stimulation. Probably the best drugs for this purpose are caffeine sodium benzoate one half to one grain, tincture of digitalis, one quarter to one minim, and brandy five to twenty minims well diluted in water. For very prompt but evanescent stimulation, as in a threatened collapse, camphorated oil (one or two grains in oil), hypodermically is generally employed. This must be repeated at hourly or two hour intervals.

Atropine has a distinctly stimulating effect on the heart, and in infants with subnormal temperature its administration tends to raise the temperature when used in connection with other appropriate and external measures, such as anointing with oil, wrapping in cotton, and supplying external heat by means of hot water bags, bottles, etc. Atropine as a cardiac stimulant in these cases may be given hypodermically in doses of from 1/1000 to 1/500 of a grain every three or four hours.

In the more severe and active forms of the inflammatory types under consideration it is not unusual to meet with varying degrees of acidosis brought about by the dehydration and loss of mineral salts previously referred to. To anticipate and prevent any such eventuality it is a wisely established practice to administer sodium bicarbonate in fifteen grain doses every three hours routinely to all infants who are more than mildly ill with inflammatory or infectious forms of gastrointestinal disease.

Should this prophylactic measure not be successful in warding off acidosis, as is sometimes the case, one must either give larger doses by mouth or administer it either intravenously or subcutaneously. The urine must be made alkaline and kept so. In using the intravenous or subcutaneous routes as much as fifty c.c. of a four per cent. solution of sodium bicarbonate may be administered at one time. This solution must be carefully prepared by sterilizing a four per cent. solution of carbonate of soda and then transforming the solution to the bicarbonate of soda by passing carbon dioxide from a Kipp generator, or a cylinder, through the cold solution until it is colorless to phenolphthalein. Even with all these precautions sloughing may result from its use.

Severe and prolonged attacks of inflammatory types of gastrointestinal disturbance frequently lead to more or less marked degrees of anemia which call for the administration in the convalescent period of such tonics and hematinics as iron and arsenic; Fowler's solution, one quarter to two minims three times a day well diluted, or the lactate or citrate of iron in doses of one quarter to one grain three times a day may be given orally, or the green citrate of iron in one quarter grain doses may be injected intramuscularly every other day alternating with sodium cacodylate three quarter grain, also intramuscularly, on alternate days.

4103 WALNUT STREET.

Dietetic Management of Summer Diarrhea

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Summer diarrheas are so distinctly and definitely preventable, that it seems advisable to consider for a moment the dietetic prophylaxis of the subject before proceeding to the management of the pathological condition. One need only call to mind the oft repeated statement that six bottlefed babies die to every one that is breastfed, to realize the tremendous immunity to disease which the breastfed infant possesses, and particularly is this true with reference to diarrheas. That a very large percentage of women can and will, with a little encouragement and advice, nurse their babies is proved by recent statistics of the prenatal department of the Starr Centre. Last year of 129 babies born consecutively under the care of this department, 128 were being breastfed at the end of the first month of life. This, almost one hundred per cent. breastfeeding, was among mothers living under the hardest possible conditions, and in an environment of poverty, ignorance and superstition. Obstetricians and maternity hospitals can do much to advance the cause of breastfeeding by encouraging the mothers to a persistent effort to do their part. The effect upon the baby's development and resistance of even a few months of breastfeeding cannot be overestimated. Early weaning should always be avoided in the summer months if possible.

A glance at the mortality statistics of any large city for the summer months of the last ten years shows the progress in baby saving which public education has effected. A cleaner milk supply, with a better understanding as to its care and handling, has very appreciably reduced the incidence of diarrheas and consequent deaths. Where artificial feeding is unavoidable it is important that the best possible milk be obtained and that it be prepared and cared for in the most sanitary manner. In the summer months all milk intended for infants should be brought to the boiling point before using. All additional food should be closely restricted by its suitability to the age and digestive capacity of the individual, always remembering that it is better to underfeed in hot weather than to chance the dangers of a digestive disturbance.

Regardless of the etiology of the various forms of summer diarrhea, the preliminary management conforms with but slight variation to one mode of procedure. At the first sign of disturbance the stomach and intestines should be cleansed immediately of all irritating substances, by means of a laxative or by colonic irrigation, or by both if necessary. All food should be withheld for a period varying from six to forty-eight hours, being replaced by boiled water, cereal decoctions, or saccharine tea and similar substances. If mothers could be taught to follow this simple procedure until the arrival of the physician, serious trouble might often be averted. In the case of diarrhea resulting from a simple gastric disturbance accompanied by stools, more or less

frequent, green in color, frothy, foul, and containing curds or undigested food, the routine outlined above is usually sufficient to relieve the condition, and a gradual return to the normal diet is readily effected.

According to the bacteriological etiology of the summer diarrheas, two types are distinguishable, the fermentative and the infectious. Both types may bear a distinct relation to bacteria. In the former, the bacteria are chiefly saprophytes which do not seriously injure the tissues, and in the latter they are chiefly parasites, which directly or indirectly injure the intestinal walls. Both types may be present and the distinction becomes an artificial one.

The fermentative or typical summer diarrhea is characterized by intoxication or infection, or both. It is due to a preponderance in the intestine of one form of bacteria, usually saprophytic, either acid forming or putrefactive. If the former type of bacteria are in excess, then the carbohydrate and fat elements in the food must be reduced or entirely withdrawn for a time. If the putrefactive are found to be in excess, then the protein element must be withheld. By far the greater number of diarrheas are caused by the excess of the former, the acid forming bacteria. The stools in this form of diarrhea are loose, green, acid and irritating, and may contain mucus.

The relief of the condition and the restoration of the digestive functions lie in suitable dietary management. Talbot states: it is possible in some instances to destroy the pathogenic microorganisms, or at any rate to diminish their number materially and inhibit their activity by the administration of antagonistic bacteria.

In the type of diarrhea under discussion, following the preliminary emptying of the intestinal tract, the withdrawal of food, and the substitution of a water diet, the return to a suitable diet must be undertaken cautiously. Beginning with cereal gruels, plain or dextrinized, broths, plain or thickened with cereals and meat fibre, proceed to a fuller diet as the condition of the patient, as indicated by the character of the stool, permits. Because of the constant tendency to relapse the quantity given should be small, the intervals long between feedings, and the strength much diluted. The return to milk should be delayed and when finally resumed it should be preferably in some form low in fat and sugar, such as diluted skimmed milk, buttermilk or casein milk. Mixtures may be gradually increased appropriate to the age and development of the patient, but the process should be slow, covering a period of several weeks.

When the diarrhea is caused by an excess of the putrefactive bacteria, the stools are brownish, foul, and alkaline. In feeding the protein must be kept low and the carbohydrate content increased. Beef juice, broth, albumen water and whey should not be

given. Any one of the cereal waters or gruels already mentioned, to which has been added milk sugar, or dextrimaltose, is a suitable beginning. In resuming milk the protein percentages in the milk should be low and very gradually increased.

The infectious type of summer diarrhea, known as ileocolitis, is distinguished by inflammation. It is frequently difficult to draw a sharp distinction between this and the fermentative. In both we have toxic substances resulting from bacterial growth, producing symptoms and in some cases pathological changes. In infectious diarrhea the bacteria principally concerned are the dysentery bacillus, the gas bacillus, colon bacillus, and the streptococcus. The stools in these cases are alkaline in reaction and show increasing frequency, with the presence of blood, mucus, and finally pus. Membrane may be present in the more severe cases.

The determination of the disturbing organism is not always possible. Streptococci may be discovered by the microscope, the gas bacillus by culture, and, according to Talbot, Baker has recently developed an intracutaneous test for the dysentery bacillus, which gives positive results in from six to eighteen hours. In cases of this type the complete withdrawal of food applies equally to breastfed infants, the usual diet being replaced by water, cereal decoctions or broth, as previously described. But the starvation period should not be too prolonged, particularly when accompanied by inanition, as the bacteria will tend to digest the protein found in the tissues, unless carbohydrate is quickly added to the diet.

For the purpose of dietary management, Talbot here divides the organisms into two general classes: first, dysenteric groups, and second, gas bacillus and allied organisms. In diarrheas caused by the first, or dysenteric group, and patient should be fed largely on carbohydrates. Lactose solution is probably the best form because of the development of lactic acid and should be given in a five to seven per cent. solution, either alone or with barley water.

As the acute symptoms subside, thickened cereal gruels, fresh beef juice, and broth thickened with meat fibre may be substituted for the weaker decoctions. In particular I would suggest the use of flour ball with either the cereal or broth diluent, or in the form of brown flour soup, using one or two teaspoonfuls with each feeding. Here again the return to any form of milk food should be begun with caution and abandoned at the first sign of relapse.

In diarrheas related to the second group of organisms—the gas and allied bacilli—the patient should be treated by feeding with a moderately high protein, the carbohydrates being kept low, and by introducing acid forming bacteria into the diet. Either skimmed milk, buttermilk or casein milk may be used, starting with a weak formula and increasing according to the progress of the patient, as indicated by the stools. Fat should be kept low. Convalescence will be slow, covering a period of from six to eight weeks or longer because of the tendency to relapse.

A bacteriological examination of the stools is not always possible. Clinically the question of suitable diet then becomes a matter of experiment, the feeding being reversed if the symptoms become worse.

In spite of frequent warnings as to the dangers of underfeeding in these trying and serious cases, I am confident that less danger can result from a careful dietetic management than from attempting to approach caloric requirements too early.

In many cases summer diarrheas are precipitated by the presence of some form of metabolic disturbance caused by an excessive amount of one or more of the food elements in the diet. As is well recognized an excess of fat or sugar rather than of protein is more likely to cause such disturbance. This condition must be considered in the return to diet following any diarrhea. The disturbing element must be kept low and introduced very slowly so as to overcome any previous intolerance.

1725 PINE STREET.

Water Treatment in Diarrhea*

By JOHN D. DONNELLY, M. D.,
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One of the complications of gastroenteritis when accompanied by vomiting and severe or prolonged diarrhea is dehydration. This is the result of rapid loss of water from the blood and tissues of the body, which in turn produces depletion of fluid in the circulation and tissues, consequently a concentration of the blood. Concentration of the blood diminishes its volume, increases its viscosity, diminishes its rate of flow, resulting in an accumulation of toxins and waste products, passive congestion of the kidney with oliguria, diminished oxidizing power of the

body cells, and favors a breaking down of body tissues.

Utheim (1) has shown that infants suffering from various diseases, with the exception of exudative diathesis and nephritis, exhibit no great change in their blood concentration. On the other hand, infants with vomiting and acute diarrhea have a high percentage of protein in their blood, the result of blood concentration.

Dehydration in infants, aside from evidences of loss of weight, presents certain definite signs. The fontanel is sunken, the skin takes on an ashy hue, which at times may be putty color, its turgor is lost,

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when folded or wrinkled it tends more or less to remain so, its elasticity is gone, the eyeballs recede, and oliguria is present. This state of dehydration calls for immediate replenishment of water in the infant's body. In the absence of vomiting and if the dehydration is only slight or beginning water by mouth usually suffices. When the infant will take water from a bottle or off a spoon, four to ten ounces daily (according to age) between feedings will maintain the water balance. If this method is not practical, water introduced by a nasal tube into the esophagus offers advantages in that it is painless and devoid of danger or of unpleasant after-effects, with the possible exception that irritation of the nares and nasopharynx may occur after the repeated use of the nasal tube. This can largely be obviated by the instillation of liquid petrolatum into the nose before the introduction of the tube and the use of a lubricant with a consistency sufficient to prevent it being easily wiped off the tube by the passage through the nose. White petrolatum serves this purpose admirably. After the tube has been passed into the esophagus, if its free end or the funnel attached to it is held under water, the absence of air bubbles makes certain that the tube has not been passed into the trachea.

When dehydration is definite or extreme, or in the presence of severe or prolonged diarrhea and vomiting, recourse must be had to means other than by way of the mouth for introducing fluid into the infant. Four routes are offered; by rectum (enteroclysis), subcutaneously (hypodermoclysis), intravenously, and intraperitoneally. We have never been able to utilize the rectal route with the degree of success which is apparently obtained by others. Rectal intolerance is usually established so early that the rectal injections become not only useless but actually harmful by setting up local irritation and reflexes which further stimulate bowel evacuations.

Hypodermoclysis of normal sterile saline solution may be used in threatened dehydration or in those cases where dehydration is only slight. Two to five per cent. dextrose (glucose) and sodium bicarbonate solutions may be used, but as their chief value lies in the water content of these solutions we rarely use them. We prefer the saline, as it is the most easily prepared and sterilized and, unlike the sodium bicarbonate, it does not have the attendant risk of producing sloughs. Saline when sterile is safe. However, hypodermoclysis is undoubtedly a painful procedure and the amounts which can be injected into small infants fall short of the needs of the average case of moderate or severe dehydration. Only about one hundred c.c. of saline can be administered at a time without causing discomfort to the infant. Larger amounts or multiple injections make the infant restless and irritable—the two things to be avoided in weak and dehydrated infants. In combating dehydration this method necessitates multiple punctures with their attending risk of suppuration, and therefore is not a method applicable for continuous use over seventy-two hours.

Intravenous administration of fluid has obvious advantages. We have used sterile solutions of normal saline, five per cent. glucose, three per cent.

sodium bicarbonate, and a glucose acacia solution, made up of glucose five grams, acacia ten grams, and normal saline, q. s. one hundred c. c. The practical difficulties of entering the infant's veins and the danger of the introduction of large amounts of fluid by the longitudinal sinus, have made us reserve this method for the treatment of marked dehydration cases only, where the call for replenishment of the depleted vascular system is an urgent one. When we use this method, the hair is shaved closely off the scalp covering the anterior fontanel and for an inch beyond. The injection into the longitudinal sinus which lies from three to five mm. beneath the scalp is made under the strictest surgical aseptic technic. The injection is made slowly, permitting the sterile fluid to enter by gravity at the rate of three or four c.c. a minute and at a temperature of 110° F. At the first sign of discomfort or marked change in the pulse or respiratory rate the needle is withdrawn, pressure made with sterile cotton over the puncture wound until all oozing has stopped, then it is cleansed with tincture of iodine and alcohol and a sterile cotton and collodion dressing applied. We have made numerous injections by this method and have not experienced any complications nor serious after-effects; on the contrary, many of our results have been most striking in their beneficial effects. The only contraindications to this method are the various forms of infectious dermatitis, particularly if the scalp is involved.

The use of the intraperitoneal route for the introduction of fluid is a comparatively recent therapeutic measure. In spite of the favorable reports of its use, it was not until we had satisfied ourselves on the cadaver that the penetration of the flaccid intestinal wall by the needle was really difficult to accomplish, were we willing to make use of this method. We have avoided the intraperitoneal injections in all cases where there was any abdominal distention, as the possibility of penetrating the intestinal wall under such circumstances cannot be denied. We carried out a series of experiments on guineapigs, employing various sterile solutions for intraperitoneal injections and found them to be without any toxic or local irritant action, when employed in proper amounts and in isotonic solutions. All fluids injected into body cavities and tissues for the purpose of immediate absorption must be isotonic and made of chemically pure substances. Otherwise, in many instances, abdominal distention, local discomfort, and signs of peritoneal irritation will follow intraperitoneal injections.

Reassured that these injections were devoid of serious risk we began our injections in the dehydrated infants and young children. Our technic is as follows: After excluding abdominal distention and the possible presence of an overdistended bladder the infant's arms and legs are restricted while in the recumbent position. The injection is made through the median line just below the umbilicus. The skin about this area is sterilized by the ordinary surgical method of preparation, tincture of iodine and alcohol. The skin and subcutaneous tissues are picked up between the thumb and the index finger of the left hand. A moderately large

(eighteen gauge), short beveled needle about two inches long, connected with a container by a rubber tube, is held in the right hand and inserted with a quick thrust, pointing upward and at an oblique angle, through the abdominal wall into the peritoneal cavity. The right thumb may be held on the needle about three quarters of an inch from the point so as to prevent too deep penetration. The sterile normal saline solution is then run in slowly by gravity at a temperature of 105° to 110° F. and continued until the abdomen is slightly distended. The needle is then removed and the puncture wound covered with a sterile dressing. Usually one to two hundred c. c. may be given to young infants, larger amounts to older babies. Any evidence of shock calls for immediate withdrawal of the needle and appropriate stimulation. The fluid should not be introduced too rapidly nor in too large quantities so as to avoid possible embarrassment to the diaphragm and heart. The whole procedure must be done under the strictest surgical aseptic technic.

During the past year we have used normal saline routinely in our intraperitoneal injections with gratifying success. A hypertonic solution of glucose (ten to sixteen per cent.) given intravenously after the intraperitoneal injection causes quicker absorption of the saline solution from the peritoneal cavity and urine excretion increases earlier than otherwise. Normal saline solution is absorbed comparatively rapidly, from the peritoneum. Postmortem examinations on infants who had received in-

traperitoneal injections from a few hours before death to weeks previously failed to show any evidences of injury or infection of the peritoneum or abdominal viscera.

The advantages of the intraperitoneal method of administering fluid to the dehydrated infant are those which were first pointed out in this country by Blackfan and Maxcy (2). They are: 1. Administration of large amounts of fluid at one time. 2. The fluid is quickly absorbed. 3. The method is a simple procedure, it is practical, and permits of repeated injections at frequent intervals with minimum risk to life.

As the circulation is replenished with fluid, by whatever method, the dehydration disappears, provided the excess loss by way of the bowel has been lessened by controlling the diarrhea, the infant's general appearance becomes better, the fontanel more full, pallor disappears, there are evidences of better circulation, both general and peripheral, toxicity is lessened, the oliguria disappears, and the whole picture is that of renewed and strengthened vitality. By this means we help tide over the necessary period for readjusting the infant's feeding and gastrointestinal tract.

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1828 PINE STREET.

The General and Dietetic Treatment of Eczema*

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Before undertaking a discussion of the constitutional and dietetic treatment of eczema in early life, a brief consideration must be given to the etiology of the disease; since treatment must necessarily be directed, at least in part, against the cause. In some instances this is apparently purely local. The skin of the infant is by nature sensitive and easily irritated, and it is readily understandable that such influences as continued moisture from a wet diaper, lack of cleanliness and dryness in the folds of the skin, as, for instance, about the neck, chronic discharges from the nose or ears, excessive perspiration, exposure to cold winds, the presence of pediculi on the scalp, the employment of an excess of soap and water, and the like, may start a cutaneous irritation which may easily develop into an eczema. Even with these prominent local causes, apparently sufficient in themselves to account for the disease in many cases, there would seem to be acting in most instances some more distant factor; otherwise, common though it is, eczema would develop in every infant or child exposed to

the unfavorable influences mentioned. Among these more distant factors, which we may call constitutional as a matter of convenience, are to be mentioned individual predisposition, inheritance, the exudative diathesis, overfeeding, other errors in diet, digestive disorders, disturbance of the urinary secretion, and impairment of metabolic processes. Limitations of space prevent a discussion in detail of the possible action of each of these factors, but I may be permitted to refer to some of those oftenest active in early life, since they bear so closely upon the treatment to be employed.

The exudative diathesis, as it was first called by Czerny, is a prominent predisposing factor, often combined with evidences of lymphatism. The children suffering from this condition show a tendency to inflammation of the skin and mucous membranes. Many of the instances formerly called scrofulous are properly to be included here, these consisting merely of cases of localized tuberculous processes occurring in exudative subjects. There is in the exudative diathesis a special tendency to the development of eczema in infancy, replaced often later by a disposition to asthma, recurrent bronchitis,

*Part of a Symposium read at a joint meeting of the Philadelphia Pediatric Society and the Philadelphia Pathological Society, March 8, 1921.

urticaria, and the like. It would be incorrect, I believe, to attribute all these to some so-called anaphylactic response. There exists the modifying basic tendency which we may call exudative. This tendency can be cured only by the passing of time, but the exciting agent which produces an attack of eczema should be sought for and removed. The causes of this nature are chiefly dietetic, and the treatment will be discussed presently.

Overfeeding is a prominent cause of eczema, even when this does not result in any evident digestive disturbance. It is a noteworthy fact that the healthy appearing, or often somewhat anemic, very fat, breastfed infants seem especially disposed to eczema. The disorder is very much less common in wasted babies. Gastrointestinal disturbances also constitute a prominent cause of the disease. It is frequently observed that an infant who has nearly or quite recovered from a more or less persistent eczema relapses readily, with the appearance of coating of the tongue, vomiting, or other sign of indigestion. Constipation, too, is an important factor in this category.

But apart from distinctly digestive disturbance, the specific influence of diet is remarkably evident in many instances. Often there appears diminished tolerance for sugar, especially maltose, and an alimentary glycosuria is readily produced. In one case under my care eczema was completely relieved by using lactose instead of the pure maltose which had been employed in the milk mixture. Other carbohydrates, such as the starches, may be the agent. Thus, in one instance the mere change from an oatmeal water diluent to one of barley water was sufficient to cure the disease. Frequently an excess of fat in the food is clearly the cause. In a recent case the reduction of the percentage of fat from two and seven tenths to two, was followed in twenty-four hours by remarkable improvement. The mineral matter of the diet has been accused by Finkelstein and others. Whether the protein can be an active agent is uncertain, yet it has at least been shown by Schloss that infants with eczema will in many instances exhibit a cutaneous reaction to certain proteins. With this statement other observers are in accord. White believed that the majority of cases of eczema will react to a cutaneous food test; Blackfan found a cutaneous reaction in twenty-two of twenty-seven cases of the disease, and O'Keefe in a recent article observed a positive protein reaction in forty-one per cent. of seventy cases studied, all the patients being under four years of age.

It is evident, therefore, that whereas food is a prominent factor, the active ingredient of this in the production of the disease must vary with the case. In this matter a most careful study of the diet is necessary in each instance. It is noteworthy that infants with eczema are prone to recover completely when the first year is passed, and a more general diet is commenced. We cannot be certain that this is due to the dietetic changes, but it is at least suggestive, and indicates that a diet solely or largely of milk may be the etiological factor in some instances.

With these facts in mind we are prepared, as far as we can be in view of our lack of exact knowl-

edge, to undertake the constitutional treatment of an infant with eczema. This may be divided into eliminative, dietetic, and medicinal. It was pointed out to me years ago by an eminent dermatologist of this city, who in turn had received the hint from an eminent obstetrician with large practical experience among women and children, that excellent results were often obtained in eczema by giving a purgative every five days. Calomel was the drug used, followed by magnesia, if the calomel alone failed to purge. I do not know that calomel is any better than any other purgative for the purpose, but certainly purgation brought about in some way has been very successful in my experience. Of course between these cycles of purgation attention must be given to the satisfactory daily evacuation of the bowels. For this purpose we do not want local measures, such as enemata and suppositories, but laxatives in small doses given by the mouth. Of course, too, reliance is not to be placed on the purgative treatment alone, but appropriate dietetic measures are to be sought for as well. First of all, an excess of food is to be avoided. The fat, rolypoly baby may be a joy to its mother, but is no healthier than others with only normal weight. Certainly if eczema develops, the amount of food must be decidedly reduced, whether the fat baby is breastfed or bottlefed. If it is not an instance of overfeeding in the total quantity of all the ingredients, then a careful experimental study must be made of the influence of each of the different food elements. We may advise a diminution in the amount of fat, and after this, if not successful, in the amount of sugar. In view of the tendency to cutaneous reactions seen in some of the cases, a reduction of some of the animal or vegetable protein of the food should be tried, after cutaneous tests have been employed to determine which protein may reasonably be suspected. Finally, in the case of infants of an age to permit it, the total amount of milk given may well be lessened, and the caloric value of the diet made up by the addition of starchy substances—always provided that starch has not been proved to be a factor in the production of the disease in such a patient. Broths are not always well borne. Perhaps this is in the cases where an excess of mineral matter is the active agent.

Before coming to any positive conclusion, however, regarding the specific influence of some element of the infant's diet, the question of the state of the general nutrition must not be forgotten. Thus, for instance, Plantenga in an article discussing the action of the butter flour mixture recommended by Czerny and Kleinschmidt, pointed out the fact that whereas some infants with a tendency to eczema were always made worse when this diet, rich in fat and carbohydrate, was given, others decidedly improved, on account of the benefit which accrued to their general nutritional state. This appeared to indicate that in the first instance the eczema was purely dietetic, while in the second it was more of a general constitutional nature.

In subjects past the first year of life, a similar study of the effect of diet must be carried out. Certain articles of diet appear to bring on eczema in certain children, without there being of necessity

any evident gastrointestinal disturbance produced. In general eggs are to be viewed with suspicion, and the milk may be tentatively much reduced in amount, or even for a time omitted from the dietary. Sometimes it is an excess of starch in the food which appears to be the cause. Only trial can determine which element is to blame.

In the way of medicinal treatment our armamentarium is limited. For infants who are experiencing loss of sleep and consequent loss of health, the result of the persistent itching, phenacetin or the bromides may be of benefit. For those with anemia iron is often useful, and especially cod liver oil. For the eczema attending chronic nasal or aural dis-

charge, and occurring in subjects of the exudative diathesis, this latter remedy is especially indicated. Bicarbonate of soda or other alkali in full dose is recommended for those subjects in whom eczema is associated, in themselves or in their parents, with asthma, recurrent vomiting, and recurrent bronchitis. Arsenic, formerly much in vogue, is now largely discredited. It has seemed to me, however, occasionally of benefit in chronic cases. Finally, the employment of purgatives, especially salines, to which reference has already been made, is to be regarded as one of the most important elements of internal medication.

1810 SPRUCE STREET.

The Management of Babies and Children Suffering from Summer Diarrhea*

By A. GRAEME MITCHELL, M. D.,
Philadelphia.

At this season of the year the consideration of summer diarrhea is timely. Often as the subject is discussed it never lacks interest, as the prevalence of the condition continues to be of the most serious consequence to the baby. In the first year of life the diarrheal diseases still cause about one quarter of the deaths. Furthermore, methods of treatment differ even among those who have given the matter most thought. We are justified in speaking of the diarrheal diseases provided we recognize that diarrhea is only a symptom of a number of different conditions.

What constitutes diarrhea? The statement of the mother is often unreliable in this respect. Her idea as to the number and character of the bowel movements that the baby should have may be incorrect. We may accept her statement as to the number but the character must be ascertained from personal inspection. In general it may be said that a baby should not have more than three stools a day.

Before entering upon a discussion of the management of summer diarrhea one must give some thought to etiology. The influence of certain factors is undisputed.

Age.—The larger percentage of cases of summer diarrhea occurs under two years of age. Babies at this age are more exclusively milk fed than older children, and they are also, as unstable and susceptible organisms, more easily influenced by infection and heat.

Time of year.—Summer is the season of most frequent occurrence of diarrheal disorders. The two influencing factors at this time are heat and infected milk. The prevalence of summer diarrhea seems to be in direct ratio to heat. Heat favors the growth of microorganisms in milk, and also causes lowered resistance on the part of the baby—a lowered digestive ability.

Type of feeding.—That bottlefed babies are more susceptible to diarrheal disorders than breastfed babies in the ratio of five to one is axiomatic. This would lay almost the entire blame for causation upon dirty and infected milk. One must remember that harmful bacteria may be introduced into the gastrointestinal tract in other ways than in milk. It is probable also that certain bacteria may be present in the digestive canal and not become pathogenic until an opportunity is offered for their growth by lowered resistance in the host. Just as the pneumococcus may be present in the mouth and not be pathogenic, so the dysentery bacillus may be a quiescent inhabitant of the normal gastrointestinal tract until a favorable field offers occasion for its proliferation and the development of its toxic properties.

State of health.—This has an influence, not only upon the susceptibility of the individual to infection, but also upon the severity and end result.

Poverty, uncleanliness and overcrowding.—These conditions increase the number of cases of summer diarrhea in various obvious ways.

Etiologically the diarrheal diseases must be divided into some classification. Thus we have mechanical diarrhea due to the ingestion of unripe fruit or vegetable matter difficult of digestion; nervous diarrhea due to the action of extremes of heat or cold, excitement or fatigue; metabolic diarrhea such as occurs in the course of an acute infection, or the eliminative diarrhea of uremia; infectious diarrhea due to the action of bacteria or their toxins; the diarrhea of indigestion due to too much food, or to the improper balance of food ingredients. Whatever the initial cause of diarrhea all types may eventually become infectious in nature. For example, a diarrhea beginning as the result of an excess of sugar in the food may be continued because of the change in intestinal flora and the proliferation of acid forming bacteria.

*Read before the West Philadelphia Medical Association, April, 1921.

In Finkelstein's classification of nutritional disturbance one finds the term alimentary intoxication. The symptoms which he describes as occurring in this condition (disturbances of consciousness, change in respiration, glycosuria, fever, diarrhea, collapse, albuminuria, disturbance in the weight curve and leucocytosis) are those which are present in the severe forms of summer diarrhea. It is difficult to accept Finkelstein's view that these symptoms are due alone to the chemical injury of food and that bacteria have nothing to do with the production of intoxication. Even admitting that various symptoms may be produced by giving food to a child whose tolerance for such food is diminished, it has not been proved that bacteria have nothing to do with the causation of the symptoms. The end results, such as acidosis, may be chemical in nature, but it cannot be denied that in gastroenteritis, not only are certain harmful bacteria often found in large numbers, but that the patient's improvement is coincident with the disappearance of these organisms and the change to a normal flora.

A satisfactory classification of the diarrheal disorders, from the point of view of treatment, is a rough division into three groups as follows: mechanical, when the intestinal mucosa is irritated by raw fruit or uncooked vegetable matter; fermentative, when abnormal fermentation of the food in the digestive canal takes place, due to the action of bacteria already present or introduced from without; infectious, when the bacteria instead of being saprophytes are true parasites and attack the intestinal mucosa itself, often causing serious lesions. It is, of course, recognized that mechanical diarrhea may merge into fermentative, and fermentative may merge into infectious diarrhea. The usefulness of a classification such as is given above will be especially apparent when the management of diet is considered.

It will be easier to proceed if the therapeutic measures are dealt with in their application to different types and grades of severity of gastroenteritis, and later the treatment of special symptoms and the diet outlined.

Purgation.—The question often arises as to whether a purgative should be given. It is undoubtedly a mistake to purge in every case of gastroenteritis. When the digestive canal has already rid itself of offending material, when the intestinal discharges are frequent and watery and dehydration is present, purgation may be harmful as well as unnecessary. If, however, fever is high and the stools contain undigested food and much mucus, an initial purge is indicated. Castor oil is usually the best, especially in view of its constipating aftereffect. If vomiting is marked, oil may not be retained and calomel may be given and followed by a saline.

Gastric and colonic lavage.—These may be good therapeutic measures in the beginning of an attack of summer diarrhea. If vomiting is a noticeable feature of the case one or two washings of the stomach with normal saline solution, or five per cent. sodium bicarbonate solution, are helpful. Colonic lavage may be done several times when the temperature is high and there is considerable offending material in the bowel. It is rarely necessary to

continue very long with colonic irrigation and it should be done cautiously, if at all, when there is blood in the stool.

Medication.—Drugs are to be used for several purposes in gastroenteritis; for purgation; to check diarrhea; for stimulation; to combat acidosis; as intestinal antiseptics; for the relief of symptoms such, for example, as pain and restlessness. The emptying of the intestinal tract by purgative drugs has already been spoken of. In giving drugs to combat diarrhea one should remember that frequent bowel movements, certainly in the beginning of a gastrointestinal upset, act as an eliminative measure. It has been pointed out that when there is fever and the digestive canal contains offending material, diarrhea is to be encouraged, but that it may continue and cease to be beneficial. Frequent watery stools lead to a fluid loss which eventuates in dehydration of the infant. When dehydration is present there is no fever, the temperature, on the contrary, often being subnormal; distention has disappeared; anything taken by mouth stimulates peristalsis and a stool results. This is the time to give such remedies as bismuth (subgallate or subcarbonate) in large doses, and if these drugs do not have the desired effect, one should not hesitate to use opium in sufficiently large doses to diminish the bowel movements to a reasonable number. For stimulation, digitalis, strychnine, atropine, caffeine, and camphor are indicated at times. The use of alcohol is often of value. It may be retained when other fluids are not, and its calories are an aid. Intestinal antiseptics are probably useless in the doses in which they may be given. Abdominal pain and restlessness are best combated by measures other than drugs. The restlessness due to toxemia is relieved when the toxemia is overcome. Occasionally quiet is so urgently needed that a small dose of morphine should be given hypodermically.

General hygienic measures.—These are of great importance and the mother should always be instructed in them. The baby's surroundings, fresh air, avoidance of chilling or of too heavy clothing which prevents a proper radiation of heat, bathing and sponging, are matters which should be under the supervision of the physician just as much as the administration of drugs or the prescribing of the diet.

So far the treatment has been comparatively simple. Not so, however, with the more serious cases of summer diarrhea—those that really tax the physician's skill. One may well ask the question, What is the cause of death in these severe cases? When one sees a child prostrated and toxic; the eyes, fontanel and abdomen sunken; the temperature excessively elevated or subnormal; the skin lax and easily lifted between the fingers; the mental condition one of irritability or coma; the urine scanty and containing albumin, casts and often sugar; the respiration infrequent and deep—from what is that child suffering? He is ill and he will die from a combination of two conditions—dehydration and acidosis. If one is to save such a child the most vigorous methods must be adopted. Purgation, irrigation, drugs, diet will not be of avail in such an extremity.

Intraperitoneal administration of fluid.—When dehydration exists, or dehydration and acidosis exist together, fluid is urgently indicated. Unfortunately fluid given by mouth or introduced by rectum will not always be retained; vomiting and diarrhea cause its expulsion before it can be absorbed. Moreover, if absorption does take place it is too slow for the immediate needs of the child. Fluid may be given by hypodermoclysis or intravenously, but the procedure of choice is the intraperitoneal route. More fluid may be given in this manner at more frequent intervals, and with less distress to the patient, than by any other method. The only contraindication to the intraperitoneal injection of fluid is abdominal distention. Normal saline is the solution employed. The same type of needle and apparatus which would be used for hypodermoclysis is required. Having first ascertained that the bladder is empty the skin of the abdomen midway between the symphysis pubis and the umbilicus is lifted with the fingers of one hand, and the other hand plunges the needle (with saline solution flowing from it) through the abdominal wall. The fluid is allowed to flow until distention of the abdomen occurs, which may be after 150 or not until 300 c.c. have been introduced. The intraperitoneal injections may be given many times and repeated within eight hours if necessary.

If acidosis is present large doses of alkalis may be given by mouth or rectum. Intravenous injections of sodium bicarbonate and glucose have their place in this connection. It should be emphasized that if dehydration can be prevented or successfully combated acidosis will not occur.

Diet.—The most important part of the management of a case of summer diarrhea is the giving of a proper diet. Thus far the etiology of the disease or the cause of symptoms have not concerned us. That is to say, whatever the reason for the vomiting, the diarrhea, the dehydration or the acidosis, they must be prevented if possible and treated if present. With the feeding, however, it is different. Not all patients with gastroenteritis can be fed in the same manner. Before following any method of feeding in these cases one must decide whether to adopt the bacteriological or the chemical classification of etiology. The bacteriological theory of causation seems to be the more satisfactory to adhere to when planning the diet. Not that every condition in which diarrhea is a symptom is necessarily due in the beginning to the action of bacteria, but many diarrheal diseases are so caused, and there is no gainsaying the fact that a change in the type of the intestinal flora is coincident with improvement in the symptoms. Such change in intestinal flora can be brought about by diet.

If it is considered that the condition known as gastroenteritis is due to bacterial action, it is necessary to distinguish between two main types—fermentative and infectious. In fermentative diarrhea the bacteria in the intestinal tract cause fermentation of the food with the formation of products which irritate the intestinal mucosa and cause diarrhea. In infectious diarrhea the bacteria not only act on the food contents of the digestive canal, but the mucosa itself is attacked. In fermentative diar-

rhea the bacteria at work are saprophytes, in infectious diarrhea they are true parasites. The bacteria which inhabit the intestinal tract in health and disease are of two groups—acid forming and putrefactive (or protein splitting). The acid forming bacteria thrive upon carbohydrates and the putrefactive thrive upon protein. If one can determine which group is causative in a given case the indications in planning the diet are clear. If the acid forming group is at fault, then the patient must be fed food high in protein and low in carbohydrate; if the putrefactive group is the trouble maker, then the food must be high in carbohydrate and low in protein. Such a diet would discourage the growth of the causative group, but encourage the growth of the antagonistic group.

In the majority of cases of summer diarrhea of the fermentative type there is an active proliferation of the acid forming bacteria in the intestinal tract. These are the cases where the intestinal discharges are frequent, green, and so highly acid (due to the action of formic, acetic and butyric acids) that the buttocks are scalded. Litmus papers shows the reaction, and it should be introduced into the rectum by a glass rod or thermometer so that the acid reaction of urine mixed with the stool will not confuse the result. In fermentative diarrhea due to acid forming bacteria the patient should be fed as follows:

In the milder cases all that is necessary is to remove sugar and boil the mixture. In the severer cases a preliminary period of starvation is to be carried out unless the intestinal tract has already rid itself of harmful material. Twelve hours is usually enough and during this time fluid, preferably as water or weak tea sweetened with saccharine, should be freely administered. After the starvation period there are several choices of food, all of which have a low carbohydrate content and a comparatively high protein content. Fat should be kept low, because in all intestinal derangements the digestion of this food element is interfered with. Boiled skimmed milk answers these requirements and it should be fed in dilutions and amounts that depend on the age and weight of the child, as well as the severity of the infection. Later, as improvement occurs, fat and sugar may be cautiously added to the food. Finkelstein's albumin milk would be indicated in this type of diarrhea because of its low carbohydrate and high protein content. Powdered casein or calcium caseinate may be added to the skimmed milk mixture to reinforce the protein. Milk fermented by the action of lactic acid bacilli has been used in this type of diarrhea with good clinical results. If used, lactic acid milk should be comparatively fat free, at first, and no sugar or other carbohydrate added.

There is a protein form of fermentative diarrhea in which, instead of green acid stools, the patient has brown, foul, alkaline stools. Under the conditions the indication is clear to give low protein and fairly high carbohydrate, such, for example, as weak milk mixtures with carbohydrate added as lactose and starch.

When the intestinal discharges contain blood and pus the patient is suffering from infectious diar-

rhea. From the macroscopic appearance of the stool it is impossible to tell what organisms are at fault. Bacteria belonging to the dysentery group are not infrequently found, but the gas bacillus may be present. It is important to know which of these organisms is causative as the management of the diet is radically different in the two types. The reaction of the stool is again a help because the dysentery bacillus, being a protein splitter, gives an alkaline reaction to the stool, whereas the gas bacillus is an acid former. However, the gas bacillus should be searched for. If careful bacteriological examination of the stool is not possible, a very simple clinical test will suffice. This is performed as follows:

To a test tube half full of milk add a peasized portion of the stool and shake well. Boil for three minutes. This will kill all the usual organisms in the stool with the exception of the gas bacillus which is a spore former. Set the test tube aside in a warm place, preferably an incubator, for twelve to twenty-four hours. At the end of this time the milk will be shot full of holes (gas bubbles) if the gas bacillus has been present in the stool. In a given case of infectious diarrhea, if the test for gas bacillus is negative the patient may be assumed to be infected with the dysentery group.

The dysentery bacillus thrives and produces its toxin when given protein to grow upon. The feeding consists of nothing but barley (or other cereal water) for twenty-four hours. The next twenty-four hours eight per cent. of lactose may be added to the cereal water. Not until the third day is a

small amount of skimmed milk added to the cereal water and lactose solution. At times, especially when the patient is seen late in the course of the disease, food is so urgently needed that the preliminary starvation period cannot be carried out.

If the gas bacillus is found the feeding may be the same as that which is recommended for fermentative diarrhea due to the acid forming group of bacteria. However, lactic acid milk is a specific for gas bacillus infection and should be the feeding of choice.

Summary.—Children and babies suffering from gastroenteritis cannot be treated routinely. One must consider in the management of an individual case the condition of the patient, the type of diarrhea, and the severity of the disturbance. If blood and pus are absent in the stools the fermentative type of diarrhea is the probable form present. If the stools contain blood and pus the patient has the infectious form of diarrhea, and the test for gas bacillus should be made. In fermentative diarrhea there are two subdivisions—the common form, due to the activity of the acid forming group of bacteria, and the uncommon form, due to the proliferation of the protein splitting organisms. Each of the different varieties of diarrhea are quite easily recognized clinically, and each has a definite dietary indication. Purgation, irrigation, and lavage are to be used only as required in the individual case. Dehydration and acidosis are conditions to be prevented if possible; if present they demand urgent treatment.

1717 PINE STREET.

The Treatment of Nutritional Disorders in Artificially Fed Infants*

By CHARLES HERRMAN, M.D.,
New York.

Although a discussion of rickets and scurvy would properly come within the scope of the title of this address, in order to keep within the space limit I shall omit these two diseases. I shall not attempt to discuss the subject in detail, but simply emphasize certain principles which should guide us in the treatment of the nutritional disorders of artificially fed infants. I believe the term nutritional disorders is preferable to digestive disorders, because the latter focuses the attention on the gastrointestinal tract, to the exclusion of many other parts of the body which are also affected.

Classification.—On account of our incomplete knowledge, a perfectly satisfactory classification of these disorders is extremely difficult. In this country, those of Holt and of Morse and Talbot are perhaps best known. Holt describes as separate entities, acute inanition, malnutrition, marasmus, acute and chronic gastritis, acute and chronic gastric indigestion, acute and chronic intestinal indigestion, acute and chronic ileocolitis, and cholera infantum.

This subdivision into a large number of groups is rather complicated. As a rule more than one segment of the digestive tract is affected and it is not always easy to determine from the symptoms just which portion is involved. The presence of vomiting is not characteristic of any one type, and we cannot always determine the character of the pathological changes in the bowels, from an examination of the stools. Even in the fatal cases of marasmus the pathological changes may be very slight. Morse and Talbot divide the cases into simple indigestion, indigestion associated with fermentation, and infectious diarrhea. They admit that it is often extremely difficult to differentiate between them, that they often merge into each other, and that it is largely a difference of degree or severity. As they state, cholera infantum has never been shown to be associated with a specific microorganism, and it is not even certain that it is of bacterial origin. It may simply represent the result of some profound disturbance of metabolism.

Etiology.—I believe that the original division of Czerny and Keller is simple and satisfactory: 1.

*Read before the Bronx County Medical Society, May 18, 1921.

Disturbances due to the food. 2. Those due to infections. 3. Those due to constitutional peculiarities of the patient. In the first group, the disturbances may be due to the quantity or the quality of the milk, or to one of its constituents. The second group comprises those associated with bacterial infections. The third represents an important group. Although it is recognized in a general way that some individuals are congenitally inferior, the laity especially do not appreciate the bearing of this fact on the individual infant. Mrs. Smith does not understand why her infant does not thrive when artificially fed, while Mrs. Jones's does beautifully. There must be something wrong with the formula.

There can be no doubt that some infants are below par when born. To mention only two well recognized types, there are the exudative and the spasmophilic or the hypertonic infant, which my colleague, Dr. Haas, has described so fully and studied so carefully. A large number of the difficult feeding cases belong to these groups.

I believe it will be better for the present not to draw the lines too sharply between the various forms of disturbance. To a great extent they represent different degrees of severity, and often merge into each other. Bearing this in mind we may conveniently divide the cases into four groups; these do not represent disease but conditions with which certain manifestations are associated.

1. The hypotrophic infant which is retarded in its development, which does not gain properly in weight, although no definite digestive disturbances are present.

2. The atrophic infant which represents an extreme grade of the preceding. This is a severe type of nutritional disturbance, with distinct retardation in development. Such infants are pale, the tissues lack tone, so that when a fold of skin and subcutaneous tissue is lifted, it stays put, and their temperature is unstable.

3. Infants with indigestion—that is, those who vomit, have abnormal stools, or both.

4. Those infants with symptoms of toxicosis. Beside fever and loss in weight, these infants present a characteristic change in the breathing, hyperpnea, and disturbances of the sensorium.

In the treatment of an infant with a nutritional disturbance, a complete history may be of the utmost importance. In those infants who are constitutionally inferior, the family history may show some members who have had eczema, asthma, or are of neuropathic tendency. It is important to know whether the baby was born prematurely and whether there is any constitutional disease in the parents, more especially syphilis. The weight at birth, and at various times since birth should be ascertained, also the exact kind of feeding since birth, whether there has been any disturbance previously, vomiting, abnormal stools, and whether it sleeps well. It is also important to note the child's disposition, facial expression, the condition of the sensorium, and the tone of the tissues.

Early treatment.—The sooner a patient is treated the better. There is too great a tendency among some to belittle the importance of nutritional disturbances, and frequently to attribute them to teeth-

ing. In this way valuable time is lost, for a mild disturbance is usually easily controlled, whereas a severe one may be impossible to treat successfully, even with the best surroundings and the most expert advice.

Attention to detail.—This is of prime importance, instructions should be written clearly, an anxious mother frequently forgets. Directions should be carried out, the food should be prepared and given as prescribed. In the severer cases, when the circumstances permit, it is preferable to have the patient in charge of a trained nurse. In a few cases in which relatives and friends interfere with the proper treatment at home, institutional care may be desirable. If there is a maternity ward attached to the hospital, the possibility of procuring breast milk is an additional advantage.

Contrast feeding.—As the choice of a new food is often in the nature of an experiment, the principle of contrast feeding is rational. The infant is placed on a food which is widely different from the one on which it did not thrive; for example, if it was doing badly on a high fat mixture, skimmed milk would be employed; if it was not making progress on a mixture containing a large percentage of carbohydrates, protein milk would be indicated.

As an underlying principle, after an acute disturbance, we begin with a small quantity of an easily digestible food, and increase the amount and strength gradually, noting the child's tolerance as manifested by an increase in weight and the absence of fever, vomiting, and abnormal stools. It is not unlike the guiding principle in the modern treatment of diabetes.

Prophylaxis.—As I have stated on a previous occasion, infant feeding is a song of many stanzas, but the refrain remains always the same, cow's milk is not woman's milk. A very large percentage of mothers, if properly encouraged and advised, can nurse their infants at least during the first few months. In 1909 and 1910, I followed up all the infants born in the maternity ward of Lebanon Hospital, and found that eighty per cent. nursed their babies entirely or partially for at least five months. Recently, by following practically every baby born in Minneapolis during a stated period, Sedgwick has demonstrated that ninety per cent. of all babies can be nursed at the breast. Infants should be kept cool during the summer months. Overheating is undoubtedly an important etiological factor in the causation of digestive disturbances in the summer. Water should be given regularly. The dehydration of the tissues, even if it is not the only factor in the causation of what we term acidosis, is certainly an important one. The milk should be of the very best quality and kept cool. Everything which comes in contact with the milk should be scrupulously clean.

TREATMENT.

Hypotrophic infants.—In those infants who are retarded in their development and do not gain in weight, the possibility of an underlying constitutional disease, more especially syphilis, should be borne in mind. Premature infants who do not thrive, usually require breast milk. If these factors

can be excluded, it should be ascertained whether the infant is receiving a sufficient amount of food. It is not advisable to give a milk mixture of less than one half strength—that is, half milk and half water, with the addition of sugar. The caloric requirements of a hypotrophic infant are greater than those of a normal infant—namely, from fifty-five to sixty calories a pound. In mild cases, the addition of dextrimaltose instead of cane or milk sugar may be sufficient to obtain a gain in weight. If the child is constipated, and the stools putty-like, a malt soup mixture will usually improve the character and the regularity of the stools. The proportions of the milk, flour, malt soup extract and water can be modified to meet the individual case, according to the age of the infant, and whether or not the bowels are constipated. For infants over six months cereals and zwieback may be added to the diet. A few may not gain in weight until fresh vegetable and fruit juices are added.

2. *Atrophic infants.*—These represent a more severe and advanced stage of the preceding group and are more difficult to handle. As their heat regulation is defective and they often have a subnormal temperature, they must be kept warm. Many of them, especially those under three months, require breast milk. After the danger period has been tided over, it may be possible to continue the improvement on a malt soup mixture. Such infants have a high caloric requirement per pound, and must therefore be given large quantities of food. It is in this group that the principle of contrast feeding sometimes finds its greatest usefulness.

3. *Indigestion.*—In cases of indigestion the indications are to remove the irritating and deleterious material from the gastrointestinal tract and to withhold food. The first is best accomplished by giving a dose of castor oil. If this is vomited, calomel may be substituted. If the vomiting persists, in

spite of the withdrawal of food, the stomach may be washed out. If the diarrhea continues after the irritating material has been entirely removed, small repeated doses of the camphorated tincture of opium are indicated. The infant is given water, barley water or tea, if possible in amount equal to the amount of milk which it is accustomed to take. If this cannot be given by mouth, it may be given by rectum, either by the Murphy drip method, or several ounces may be introduced three or four times a day. Food is withheld for twelve or at most twenty-four hours. In those cases in which the indigestion is associated with marked fermentation in the bowel, protein milk is given. In simple indigestion, I usually begin with a milk powder, preferably made from skimmed milk, of which there are now several on the market. Later the infant may be given skimmed milk and gradually brought back to diluted whole milk with dextrimaltose added.

4. *Toxicosis.*—Infants with manifestations of toxicosis are desperately ill, so that even with the best possible care the majority succumb. While the acute symptoms, hyperpnea, fever and disturbed sensorium, are present, food is withheld for twelve to twenty-four hours. The tissues must be supplied with large quantities of water. If this cannot be given by mouth or rectum, it can be given subcutaneously, intravenously or intraperitoneally. The last method has now been employed in a large number of hospitals, and has been shown to be effective, and without danger. After the acute symptoms have subsided, very small quantities of breast milk, one teaspoonful every hour or two, are given, and the amount is gradually increased, the infant being watched for any recurrence of symptoms. If the patients can be tided over the danger period, a small number may be saved, but the prognosis is always extremely grave.

76 WEST EIGHTY-SIXTH STREET.

Unemphasized Essentials in Infant Feeding*

By JESSE R. GERSTLEY, M. D.,

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Probably one of the most important causes of dissension among pediatricists of the various schools is the significance attached to stool examination. In the diagnosis and therapy of infantile diarrheal disease a large number of skilled pediatricists are guided largely by the baby's diaper, and if this does not suffice, by the microscope. The presence of fat establishes a fat diarrhea, or undigested starch a starch diarrhea. Treatment then reduces or removes the offending element of food. While much success must attend this method, nevertheless another procedure may be a little more appropriate to the changing philosophy of the day.

This is distinctly the era of the baby. Pediatricists

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concern themselves more and more with their patient as a whole. The era of pathology is on the wane. To the interest in the entire child, the painstaking pathological anatomical diagnoses of the previous decade become of minor importance. To establish laborious minutiae of pathology is not as important to physician or parent as to succeed in developing a happy, smiling, and thriving child. So in the methods of treatment adopted by some pediatricists, definite clinical symptoms and even unquestionable pathological diagnoses are often disregarded in the larger interest of the patient's welfare. The index of the latter is the weight curve and not the stool.

Stool examination unquestionably tells of conditions in the gastrointestinal tract. Suppose we say,

however, that we are more deeply concerned with the whole baby than with the stomach and the intestines. Perhaps, if we disregard the gastrointestinal symptoms to some extent and devote our treatment to the weight curve—i. e., to the whole body—local symptoms will improve proportionately to the improvement in the general condition.

To be more specific. In a case of diarrhea of a

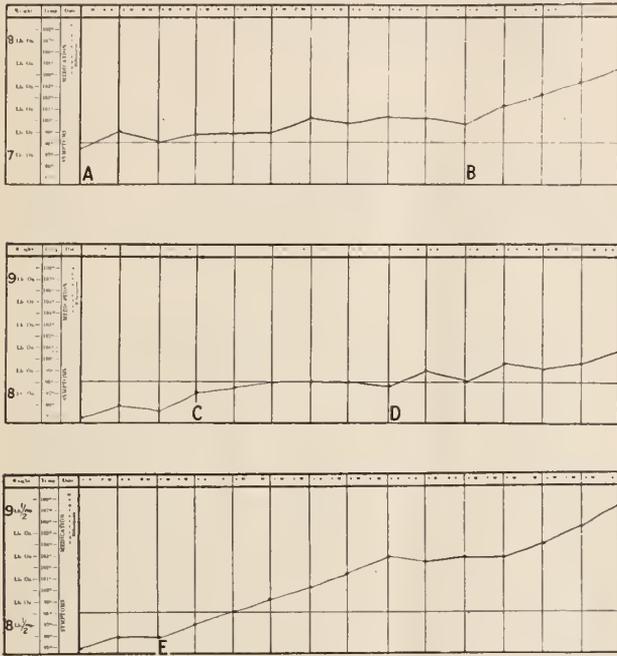


Chart I.—A, Child's feedings had been increased to albumen milk twenty-eight ounces with three per cent. dextrimaltose. B, Dextrimaltose five per cent. C, Daily total thirty-two ounces. D, Dextrimaltose seven per cent. E, Dextrimaltose nine per cent. In this case as the stools were normal throughout there could be little question as to the advisability of the increase.

fermentative or even an infectious nature two problems must always be borne in mind. First, what is the condition of the child's intestine? Logically, the food prescribed should be the most easily tolerated and assimilated. The second problem, What is the condition of this child's body? is more important. What is needed to increase resistance to this disease? How can we guide the needed nourishment through the intestinal wall?

Scientifically, upon an experimental basis, these problems may not have been answered. Clinically, however, the problem is fairly definitely settled. To carry on the daily work, to thrive, to keep up temperature, to furnish energy for metabolism, above all things to gain weight, the body needs carbohydrate. Even in a healthy child, the response of the weight curve to dietetic variations of carbohydrate is striking. Much more pronounced is the reaction of the infant suffering from malnutrition or decomposition. Here the presence or absence of carbohydrate determines life or death.

At once it would appear that the problem of therapy becomes complex. Carbohydrate fermentation in the intestinal tract produces irritating acids which cause severe diarrhea with resulting dehydration, prostration, loss of weight, and collapse. Carbohydrate is the fuel so badly needed by the starving cells of the body. To increase the amount

in the ordinary way is out of the question. Fermentation becoming wild and uncontrollable sweeps on to a fatal alimentary intoxication.

This problem, the dilemma of pediatricists for years, has at last been solved by albumen milk. Based upon the older philosophy of exclusive attention to the gastrointestinal tract albumen milk was devised with the idea of combating intestinal fermentation by reducing carbohydrate and whey. It serves this purpose well, but the loss in weight following its administration showed that it did not meet the larger demands of the baby's body.

Further studies showed that upon a diet of albumen milk the child's body to exist needed a minimum of three per cent. carbohydrate. Further work demonstrated that often five per cent. became necessary. But if no weight increase follows what then? Suppose fermentation stopped by albumen milk is activated again by the increasing carbohydrate. Here our new philosophy becomes useful—the intestine or the baby? Obviously the intestine suggests a decrease of carbohydrate. The body as evidenced by the stationary weight curve demands an increase. Thinking of the baby first, we consider an increase to seven per cent. and if no response even nine per cent. Perhaps if sufficient carbohydrate enters the body, in spite of some lost in the increased diarrhea, the improvement in the general nutrition may result in a corresponding improvement of the gastrointestinal tract. That this philosophy leads to success is evidenced by a large series of cases, but as yet the majority of the profession seem loath to adopt such radical teaching. It must be emphasized, however, that such methods can be employed only with albumen milk. This mixture with its high protein and low whey seems able to cope with a high carbohydrate

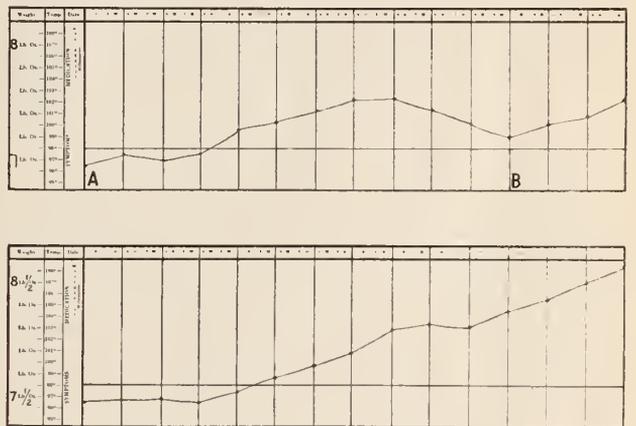


Chart II.—This patient was more perplexing. At A, the diet had been increased to albumen milk with five per cent. dextrimaltose thirty-one and one half ounces daily. At B, one faces a grave problem. Here the six soft, green stools daily, suggest an increasing intolerance of the intestine. The dropping weight curve shows the need of the body for food. Should one treat the intestine and withdraw the food? Should one treat the body and increase? With a child under close observation, in a fairly satisfactory condition and on albumen milk, it is permissible to follow the latter procedure. At B, dextrimaltose was increased to seven per cent. The immediate response of the child's general nutrition to the food led to a proportionate increase in the efficiency of the gastrointestinal tract and within two weeks the stools were normal.

drate in the intestine, while such an increase to an ordinary milk mixture would result in uncontrollable and fatal diarrhea. Thus, albumen milk serves a purpose never intended. It conveys a much higher

carbohydrate through the intestine to the starving body cells than can many of the usual mixtures.

The accompanying curves are representative. The history in each case was typical of a non-thriving child treated with many changes of diet. The physical was the usual malnutrition or decomposition. The clinical diagnosis in each case was alimentary intoxication. Upon tea and small quantities of albumen milk, the children made satisfac-

tory recoveries. The accompanying charts show conditions after three weeks of treatment. Each patient was then eleven weeks of age. Patient one had reacted with normal stools. Patient two still showed five to six soft greenish movements daily. Patient one took daily twenty-eight ounces of albumen milk, later increased to thirty-two ounces. Patient two took daily thirty-one and one half ounces of albumen milk.

CHICAGO BEACH HOTEL.

The Relation of Herpes Zoster to Chickenpox

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Of late years considerable evidence has accumulated to show that there may be a common cause for chickenpox and some cases of herpes zoster. Until now, this evidence has been clinical rather than experimental. The striking thing throughout is the occurrence of one disease after the other within the incubation period of chickenpox. The subject has been reviewed a number of times, most recently by McEwen. Certain aspects seem worthy of further consideration and will be discussed after the preliminary outline of the subject.

Considering the relationship between herpes zoster and chickenpox, it must be carefully borne in mind that herpes zoster is more frequently a manifestation of some disease. Cases due to cerebrospinal meningitis of syphilitic or other etiology, to myelitis and syringomyelia, and to various infections other than chickenpox, are very common. Those cases of herpes zoster which follow the extensive use of arsenic must also be included within the symptomatic group. Cases of such etiology must be ruled out, for under such circumstances no relation to chickenpox could be expected.

Herpes zoster may, for practical purposes, be divided into two groups, essential and symptomatic, that is to say, cases in which the primary cause cannot be determined and those in which some of the causes mentioned above are demonstrable. In the first or essential group the symptoms of onset are very often those of an acute infection. Kraus says: "The disease usually begins with the symptoms of an acute infection. There may be fever as high as 102° F., chills, malaise, pain either somatic or visceral, and of the neuralgic type. The patient may be prostrated. At this stage of the disease diagnosis is difficult. Various conditions may be mistaken for it, such as pneumonia, pleurisy, acute abdominal conditions, otitis media, and the several causes of lumbar pain. In children pain may be quite absent, while in adults, particularly of advanced age, the pain is usually very severe, continuous, and of a burning or boring nature. The presence of hyperesthesia over the painful area may assist in the diagnosis. In some cases, the peripheral stage is absent and the first sign is the herpetic stage."

THE THEORY OF THE UNDERLYING FACTORS OF THE RELATION OF HERPES ZOSTER AND VARICELLA.

Low has advanced the following theory in explanation of the coincidence of these two diseases. He believes that the toxin reaches the cerebrospinal fluid via the lymph channels of the olfactory nerves, and affects the spinal ganglia (herpes zoster). This occurs before the infection gets into the blood stream, thus causing a general infection (chickenpox). In this connection it is interesting to note that chickenpox begins in the respiratory tract and that the virus of chickenpox enters by this pathway (Jay F. Schamberg). There are a number of other infectious diseases of the central nervous system, such as epidemic cerebrospinal meningitis and epidemic encephalitis, whose pathway of entrance to the nervous system is by way of the respiratory tract and which are complicated in some instances by skin involvement. For the present Low's theory explains some of the coincidences of the diseases under consideration. However, it is difficult to understand why, if there is a known virus, it should involve the skin in some instances by way of the blood stream, while in others it should affect the spinal ganglia and particularly only two or three, as is most frequently the case in herpes zoster.

THE QUESTION OF IMMUNITY.

The fact that herpes zoster does recur has been taken as an argument against the identity of the two diseases, since chickenpox confers immunity. However, it will be necessary to determine that the recurrent cases of herpes zoster are not of the symptomatic variety, before this argument becomes a potent one against the theory. The argument that patients who have had one of the diseases may acquire the other at some other time of life, must be subjected to the same careful scrutiny.

THE CLINICAL EVIDENCE.

In discussing the relations of these diseases it becomes necessary to consider the possibility, not only of generalized skin eruption which resembles herpes zoster, but also of localized skin eruption which resembles chickenpox. Cases of this kind are sometimes difficult of diagnosis.

A. Generalized herpes zoster and localized chickenpox.—Much has been written of this in connection with its possible relation to chickenpox. The condition may consist of a localized herpetic eruption with scattered aberrant vesicles appearing at the same time, or scattered aberrant vesicles which appear after the herpes has set in. Little is to be gained by a lengthy discussion of this matter. In many cases the examiner has been in doubt as to what to diagnose, herpes or varicella. The same applies to the cases which have been designated localized chickenpox.

B. The occurrence of the two diseases in the same or different but exposed individuals.—1. Cases of chickenpox followed by herpes zoster in another individual: Feer reported the following coincidence: A child contracted chickenpox. Two weeks later herpes developed in a boy of nine who had been in contact with the above mentioned case of chickenpox. Seventeen and twenty days later, respectively, chickenpox developed in two children who had been in contact with this case of herpes zoster. Garé reports two cases of chickenpox in a family of three children, which was followed about two weeks later by herpes zoster in the third.

2. Herpes zoster followed by chickenpox in another individual: Chickenpox follows herpes zoster much more frequently than herpes zoster follows chickenpox. The following are typical case reports: C. Wilson, in a short memorandum, describes the case of a man of forty-nine with herpes zoster of the right lower extremity. Seventeen days later chickenpox developed in his son. Taylor mentions the case of a woman with herpes zoster of the trigeminal nerve in whose daughter chickenpox developed a fortnight later. He cites another case, almost identical, in which two children contracted chickenpox a week or two after having been in contact with a man with herpes zoster. Herderschee records a case of a nursing woman with herpes zoster in whose nursing child chickenpox developed ten days later. Two weeks after that chickenpox appeared in an older child and two weeks after that it appeared in a still older child. Von Bokay recorded thirteen cases of herpes zoster which were followed by chickenpox from eight to twenty days later. A. I. Cooke, in a short memorandum, cites the case of a girl of sixteen in whom chickenpox developed a fortnight after her father had had shingles. Ker reported four cases of chickenpox after herpes zoster. LeFeuvre in his review, noted that forty one of the fifty cases which he had collected belonged in this group. Five of these cases he collected himself. Charpentier, Dingwell, Fordyce, and C. Wilson report cases of chickenpox following herpes zoster. Others could be added. The number of cases of chickenpox following herpes zoster far exceeds those showing the opposite sequence. McEwen estimates the former at forty, of a probable sixty reported cases of both kinds. No reason for this is apparent.

3. Herpes zoster and chickenpox occurring simultaneously in the same individual: This coincidence has also been reported. Low cites the case of a woman of forty in whom herpes zoster was followed in two weeks by chickenpox. Neither of these

diseases was present in the house, though a case of chickenpox had occurred in the neighborhood. Dr. Fairbanks, the assistant resident neurologist at Bellevue, to whom I happened to mention this subject, told me that her little sister of five had had an attack of herpes zoster somewhere between the sixth and ninth thoracic segments, during an attack of chickenpox, and about two weeks after the onset of that disease. Bruijning reports a case of the coincidence of herpes zoster and chickenpox. Goldberg and Francis record the history of three patients having chickenpox and herpes zoster at the same time. Head and Corlett and Richardson have recorded similar coincidences. Other cases are reported.

4. Herpes zoster and chickenpox occurring simultaneously in different individuals closely associated: This relationship of the two diseases has also been reported. Oakes cites an instance of two children in the same household, one of whom had herpes zoster and the other chickenpox. Gray cites an instance of herpes zoster in one of three brothers which had followed within twenty-one days by chickenpox in the two other brothers.

5. Herpes zoster and chickenpox may occur simultaneously in the same individual and chickenpox may then be transmitted to another (McEwen's case).

6. Separate epidemics of both herpes zoster and chickenpox have often been reported. They have been reported together (Heim).

7. Summary: Briefly summarized, cases are on record showing that one disease may be present with, or may appear after the other in different individuals, and that no matter which is first, the other may follow. The sequence herpes zoster—chickenpox is most common. When the diseases follow each other in the same individual the sequence is herpes zoster—chickenpox. This latter may then give rise to either disease.

INCUBATION PERIOD.

It is striking that, when one disease has followed the other in different individuals, the incubation period, with very rare exceptions, has been within that of chickenpox—twenty-one days. When the two diseases have occurred in the same person the interval has not been more than seven days, while it has been as short as two days. Such closeness of occurrence can easily be explained by the time required for the infection to pass from the spinal fluid or ganglia to the skin via the blood stream. This time relationship of the occurrence of the two diseases has impressed many of those writing on the subject.

DISTRIBUTION OF THE LESIONS.

There exists a definite similarity between the localization of chickenpox and herpes zoster. Neither affect the palms or soles. Both have a predilection for the thoracic region. That these facts alone may not be taken as good argument in favor of identity of cause is obvious. But combined with all the other arguments they become of value.

PATHOLOGY.

The pathology of the two diseases is almost identical. The sole difference is that the lesion is unilo-

cular in herpes zoster and multilocular in chickenpox. Scarring follows in both conditions.

PAIN.

The absence of pain in chickenpox is not difficult to explain. There is no nerve lesion. In herpes the lesion is essentially a nerve lesion (posterior ganglia). Furthermore, painless conditions occurring in children in which the diagnosis is in doubt cannot be settled on the basis of the presence or absence of pain, since as is well known, herpes in children is rarely associated with pain.

THE CEREBROSPINAL FLUID.

The argument that the presence of cerebrospinal fluid changes in herpes zoster and the lack of these in chickenpox nullifies the identity of the disease, is untenable. In chickenpox the virus invades the blood. Cerebrospinal fluid changes would not be expected. When it invades the cerebrospinal fluid (herpes zoster) they would. By analogy, when the pneumococcus invades the blood, no spinal fluid changes are present, while when it invades the spinal fluid, there are.

CONCLUSION.

The pathology of the two diseases cannot be used as a basis for or against concluding identity of cause, since it is quite possible that two closely allied poisons might produce practically identical lesions. The same applies to the distribution.

At the present time, however, enough instances of the coincidence of these two diseases have occurred to make it more than likely that they have a common cause, at least when they appear within twenty-one days of each other. The occurrence of herpes zoster without any definite association with chickenpox or other cases of herpes zoster is not an argument against this thesis, since herpes zoster is very often only a secondary manifestation of some other disease.

It appears that the sequence may be in either direction, herpes zoster-chickenpox or chickenpox-herpes zoster. The former is much more common. This gives rise to the notion that when the diseases appear in the same individual, the virus becomes disseminated in the blood, due to the vascular damage in the ganglia. This would explain the aberrant vesicles of generalized herpes zoster. No explanation of transmission of either disease to others is at hand.

Two methods of solving the matter present themselves: 1. Experimental. Up to now, however, no organism or virus has been demonstrated for either disease. 2. By abundant reports of instances of the coincidence of the two diseases and through the efforts of boards of health. Were herpes zoster made a reportable disease, some light would soon be thrown on the matter.

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The Management of Children Presenting the Postepidemic Encephalitis Syndrome*

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In order to manage any mental case logically and scientifically, modern therapeutic methods have made it imperative for one to make searching inquiries into the environment, heredity, birth, infancy and adolescence of the patient in question; for all of these factors play an important rôle in determining the mode of conduct of an individual, in illness as well as in disease. Somatic diseases occurring during infancy and childhood, especially when the intracranial contents are involved in the disease process, leave indelible imprints upon the various factors that collectively determine the type of reaction of an individual to a given situation. While the general practitioner appreciates the profound change of conduct that results from such disorders as hemorrhage in the newborn, meningitis and syphilis, it is only he who has been specially trained in diseases of the nervous system, who is in a position to realize fully the effects of such general diseases as scurvy, rickets, scarlet fever, and enteritis upon normal mental development.

For nearly four years the attention of the best medical minds of the world has been arrested and held by a pandemic disease which attacked essentially the nervous system and has counted among its many victims principally the young adults and children. While the acute phase of the infection has now practically subsided, there are still many sporadic cases reported, and, furthermore, we now are left with a group of individuals who have been handicapped in their efforts of adjustment because of their illness.

In a previous communication (1) we reported a group of children who had had definite attacks of encephalitis lethargica, had made apparent recoveries from the disease, and subsequently showed conduct disorders, which made it necessary for their families to send them to the psychopathic wards of Bellevue Hospital for observation and treatment.

While they differed somewhat in their conduct disorders, they all presented a more or less uniform mental picture, characterized by "purposeless impulsive motor acts, marked irritability, definite attention disorders, distractibility and changing variable moods, inadequate and inconsistent emotional reactions, marked insomnia, and, in two cases, precocious sexual feelings and intense eroticisms." (1) The uniformity in their reactions was such as to make us feel that the disorder was entirely different from anything we had seen previously, caused by a disease hitherto unknown and, therefore, deserving the name of a syndrome.

The following two cases illustrate very well the type of reaction that is met with in these cases. They will also serve to illustrate the additional fact that in many of the cases presenting the postepidemic encephalitic syndrome there may be a reversal of the normal sleeping formula—i e., these patients may be somnolent during the day and restless and wideawake at night.

CASE I.—L. L., admitted January 2, 1920, female, white, aged thirteen years, nine months; native of United States, schoolgirl, at present in 7B grade. Family history was negative. The patient was third in family of four; was a full term normal child; delivery uneventful, weighed eight pounds at birth; breast and bottle fed; walked at thirteen months, talked at same time; had been a very healthy child; had diphtheria at ten years, without complications, and measles as an infant. She had always been a quiet, well behaved normal child until after the present illness.

Present illness.—Began at Eastertime, 1920, when she had a slight respiratory infection; then complained of legs aching and saw double. Following this, she had tic of all the facial muscles; later a twitching of the shoulders was noticed, and with this she made a peculiar grunting noise. The diplopia lasted about two weeks and the other manifestations noted above lasted about the same length of time. About two weeks after the onset of her illness, insomnia developed and she was very restless and apprehensive at night, twisting and turning in bed almost constantly.

Since her illness, the disposition of the child changed entirely; she became disobedient, answered her mother back in a very insolent way and was very fussy about everything. She became very irritable and struck the younger children without adequate provocation. She became very slow in school and her deportment was bad; previously, her conduct in school had been excellent and she had done well. Her mother thought that her poor record was due to lack of attention. She had been retarded in the motor field all summer and talked to herself a great deal. She had a ravenous appetite, lost an interest in housework, which she used to show, she continued to sleep poorly at night, especially the early part, but from early morning she slept well and also slept a great deal during the day. She still continued to be apprehensive, even during the day, and wanted the windows and doors kept locked. Her interest in anything tired easily.

On examination, she showed a very natural attitude; was perfectly clear mentally; realized that her condition was abnormal and was very anxious to

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get well. She stated that when her illness developed, she was drowsy and that her eyes became crossed and she made all kinds of motions with her face. After that, she said, she did not sleep for six months; now was able to sleep a little. She was unable to offer any explanation for her irritability, except that she had "a French temper" (her father's relatives were born in France). She further stated that she tired easily and that she felt sleepy during the day; also that she felt much different than she used to; that now she felt sleepy in school and was unable to put her mind on things. Her memory and orientation were intact, no delusional or hallucinatory trends were elicited.

Intelligence examination by the Stanford scale showed an intelligence quotient of ninety per cent., placing her in the group of normals, although somewhat retarded. Physical examination showed a well nourished and well developed child, four feet eleven inches in height, weight ninety-five pounds, no cranial nerve palsies. All deep reflexes were equally active; there were no pathological reflexes elicited; she walked in a rather rigid manner, but examination of the individual limbs and muscles elicited no spasticity. General sensory examination showed no disturbances. Eye grounds showed no pathological condition on examination. Her vision was 20/20 in each eye. Blood Wassermann and urinary examinations were negative. She showed normal pulse, temperature and respiratory curve.

During her residence here she was rather excitable at times, twisting her fingers and biting her lips, and she showed difficulty in concentration. At times she had difficulties with the other children. This soon passed, however, and she showed marked improvement. Her sleep at first was a little disturbed but later, under the influence of occupational therapy, this became practically normal. She was discharged as much improved on January 30, 1921.

CASE II.—J. E., male, aged nine years, admitted January 26, 1921. Chief complaint, insomnia at night and somnolence during the day. Unable to learn well.

Family history.—Father was an American born citizen, who, in 1908, at the age of twenty-one, had gone to Germany to establish business associations. He remained there, married an Austrian girl whom he had met in Germany, and established a residence there, retaining his American citizenship, however. The family history, both maternal and paternal, was good for two generations back.

Personal history.—The patient was born in 1911. He was of normal birth and normal infancy; he had had none of the other diseases of infancy except measles. He was considered an average child and learned easily and had acquired a good knowledge of both the German and English languages. At the outbreak of the war, in 1914, his father was not pressed into military service because of his American citizenship. When the United States entered the war, in 1917, the father was held as an alien enemy and the family suffered great privations. They lived close to the fighting zone and were in several air raids. The greater part of the time they were compelled to live in a cellar.

The patient would often have to pass days without any food and was forced to undergo other indescribable experiences. At the conclusion of the war, the family migrated to America. The father was apprehended in Paris and held a prisoner for four weeks, being suspected as a possible German spy. The informant stated that the father was often maltreated by the French police and she had been told many times that he would be shot as a spy. When released, the father's face was badly bruised and the patient suffered great fear at the sight of his father. When they came to America, in February, 1919, the patient got along very well with other children and made excellent adaptation to his new country.

Present illness.—In January, 1920, the patient was taken ill suddenly with fever and restlessness and, later, somnolence. He slept for six continuous weeks. At times he was in delirium, in which he would call to his mother and point at the ceiling, saying there were aeroplanes and Zeppelins around and asking her to remove him to a cellar. At other times in his delirium he would call to his mother and point at the ceiling, saying that he saw his father with a distorted bruised face, saying that there were people eating his father.

At the end of six weeks the fever gradually declined and he began to sit up and his sensorium gradually cleared. In March, his mother took him to the Catskill Mountains, where he remained for two months. Since his return from the mountains the patient had become quite restless, he became rather disobedient, would not mind his mother, and he had a ravenous appetite. He could not sleep at night and would prevent his mother from sleeping. During the daytime, however, he would often go to sleep, even while standing. It was impossible for him to learn readily and in talking he would frequently interpose English words when speaking German and vice versa. He remained indoors the greater part of the day and would not associate with the other children.

At Bellevue Hospital, the patient showed a well developed, well nourished physical condition. His pupils were equal, regular and reacted to light and accommodation. There was no nystagmus; his cranial nerves were intact. There were no tremors anywhere in the body. All superficial and deep reflexes were of the normal type. His gait was normal and his station was steady; he showed no pyramidal tract signs, and no sensory disturbances. His heart and lungs were normal. His pulse was 82, respirations 24.

Mentally, he was at first rather quiet, somewhat forgetful, did not know anything about his clothing, appeared rather restless, and seemed to prefer to be by himself. Would frequently interchange his German and English when speaking. He did not associate with the other children in the ward. He did not seem to be pleased with his examination, coöperated very poorly, and showed considerable irritability. His mental tension was definitely lowered; his memory and retention were somewhat impaired. He showed definite attention disorder and could not hold his attention on one subject for any length of time. Intelligence examination by the

Stanford scale on January 28th showed that he had at that time a mental age of six years four months with an intelligence quotient of sixty-seven per cent. The psychologist, however, wisely added the fact that patient ought to be retested later, in view of his personal history in reference to the unfortunate experiences during the war, as it was quite possible that his difficulties might be due to some other cause rather than to an intellectual defect, and that the mental age and the intelligence quotient obtained at this test were probably incorrect.

The patient was immediately placed with the other children. He required no sedatives nor any milder therapeutic measures. He was kept from sleeping during the day, was allowed to attend his school both in the morning and afternoon and was placed upon occupational therapy. Since that time he gradually became brighter, liked to associate with the other patients, and slept very satisfactorily at night. His condition, though far from satisfactory, indicated that he was on the way to greater improvement.

A mental test, done on February 7th by the same psychologist, placed the mental age of the patient at seven years six months, with an intelligence quotient of seventy-seven per cent. A supplemental note by the psychologist stated that the gain of one year and two months in his mental age was due to the fact that the patient had shown considerable improvement, both in his attitude and general conduct. In the ward, he was less timid and talked more freely and there was sufficient reason to expect further improvement in his mental age.

In presenting our plan of therapy, we have taken into consideration mainly two factors: first, the anatomical lesions occurring in the disease; and second, those psychological factors usually employed in the proper management of any child. In order to understand the rationale of our therapy, it would be opportune at this moment to describe briefly the pathology of the disease process, both in the acute period of the disease and during convalescence. All the necropsy material thus far reported show that the most profound change noted in the brains of the patients in these cases is the intense mesodermic inflammatory reaction. It is true that the ectodermic tissue also undergoes considerable degeneration, as is evidenced by the fact that one not infrequently encounters many nerve cells which are the seat of cloudy swelling, chromatolysis and eccentrically seated nuclei, and others are apparently the seat of neurophagy. There is also considerable neuroglia reaction. But this is practically overlooked when one glances through the microscopic preparations and sees the marked edema, the loading of the Virchow-Robin spaces with lymphoid and plasma cells, the proliferation of the endothelial cells, and the collection of lymphocytes in the nerve tissues.

As explained in our previous communication, the resolving mesodermic inflammatory tissue and the replacement of some of the destroyed nerve tissue by neuroglia scar tissue, act as stimulating and irritating agents to the remaining relatively normal nerve tissue; the latter, responding to this stimulation and irritation in the usual physiological manner, produces various forms of both motor and sen-

sory disturbances and causes the conduct disorder under consideration.

We have divided our therapy into five subdivisions, because we found these to be the salient points which offered the greatest difficulty in the management of these cases. They are as follows: 1, diet; 2, sleep; 3, schooling; 4, psychomotor restlessness; 5, drug therapy.

1. *Diet*.—As pointed out, the brain in these patients is very active, due to the irritability of the nerve tissue, caused by the resolving inflammatory reaction. Nervous activity requires considerable fuel, and this has been shown clinically by the fact that most of the patients have a ravenous appetite. We, therefore, gave them plenty of wholesome food, and at more frequent intervals than ordinarily employed. These patients ought to be fed more frequently than the average child, to compensate for the increased nerve activity.

2. *Sleep*.—We found that the most important factor to prevent the reversal of formula from nocturnal to diurnal sleep, was to keep the patient awake during the day and to keep him occupied with some manual occupation. This occupational therapy caused considerable physical fatigue, and, toward evening, the patients slept very well, in the majority of cases without a sedative. Not infrequently it was necessary to give the more restless patients a dry pack, and, the still more disturbed patients, a wet pack. Rarely did we employ any drug sedative and then only the one that had no cumulative action, the drug employed being paraldehyde. The majority of patients slept very well at night, after several days' residence in the ward.

3. *Schooling*.—These patients were in the formative period of their lives and, while handicapped by their physical ailments, we regarded them in a position to receive some schooling. We tried as nearly as possible to avoid those factors that would tax their memory or attention, as those were the two faculties chiefly impaired by the disease. We therefore, placed them under the charge of the teacher assigned to the ward, who employed essentially those measures that would promote associative ideas and prevent taxing the memory and attention. Manual training, in the form of occupational therapy, was one of the measures chiefly employed. We endeavored as much as possible, to cater to the play instinct that is common in every child, and ordinary games were frequently employed. It is of great interest to study the patient in the last mentioned case, who had apparently gained one year and two months in mental rating, after a residence of only eight days. One should be very careful in rating the natural mental endowment of these patients, as the majority of them will rate far below what their natural endowment really is. With the restitution to normal there is great improvement in the intelligence.

4. *Psychomotor restlessness*.—This we tried to combat essentially by limiting as nearly as possible irritating stimuli from reaching the convalescing cortex. The children were placed among other groups of children and were allowed to play and participate in all forms of amusement. They were never ordered to do things, though gradually en-

couraged to adapt themselves to the routine of the ward. Occasionally we found it necessary to use a wet pack and in the more disturbed cases a warm bath.

5. *Drugs.*—Drugs were rarely used in these cases. We found that, as in other conditions where the brain is the seat of a pathological process, the patients in general reacted very unfavorably towards the drugs employed as a sedative. From the study of conditions of excitement, seen in general paralysis and exhaustive states, we have come to the conclusion that the drugs usually employed as sedatives do more harm than good. Of course, there are times when a sedative must be employed, in which case we used paraldehyde, as that is the only drug to our knowledge that has no cumulative action, if used judiciously, and is, therefore, the least harmful of all sedatives.

In conclusion, we feel that while much might be expected from the plan of therapy outlined in this paper, one should be guarded in giving an ultimate prognosis. With careful management, these patients might be placed in a position to be self-supporting and able to make a proper adjustment. We further feel that they will always tend to show emotional instability and impulsive tendencies and that their brains will always be an organ of lowered resistance.

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Remarks on Nephritis in Children*

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Nephritis occurs in childhood under a great variety of circumstances, including all of the acute general infections. In the absence of gross symptoms it is easily overlooked, largely because of the apparent difficulty of making urinary analyses. These difficulties, however, are exaggerated, and in any case there is no excuse for failure to attempt an analysis. Thus the urine may be caught on absorbent cotton and expressed into a bottle until enough has been secured for the more vitally important tests, or a urinal may be worn for a time—a wide mouthed bottle for girls and a condom for boys. Finally, it is always possible to obtain a catheter specimen, and if aseptic precautions are observed there is no danger from this procedure.

The mere presence of albumin in a specimen of urine free from formed elements should not influence us to exclude nephritis, and in such a case we should make further examinations. While the early albuminuria may be febrile, the picture may change unexpectedly to that of nephritis. The following is a personal case in point. A boy of nine years, who was at the beginning of the third week of a mild attack of scarlet fever, began to vomit off and on, and complain of headache, while his face showed slight puffiness. I had his urine examined at a laboratory twice at three day intervals, and also made almost daily examinations myself. There were always traces of albumin, but neither blood nor casts. At the end of the third week I left town for one day and another doctor was called in because of scanty urine. On my visit the following day I was astonished to find the child very ill with inspiratory dyspnea, hoarseness, and difficulty in swallowing. I depressed the tongue and made a digital examination, discovering a very much swollen

epiglottis. Cultures from the throat and nose excluded the presence of diphtheria. It was out of the question to obtain promptly a specimen of urine—the child was too ill to be catheterized—and before we could have sacrificed the epiglottis or performed intubation or tracheotomy, the patient succumbed. This case taught me never to give an absolutely favorable prognosis even in an apparently mild case of nephritis.

The general prognosis of nephritis in childhood is good or, in other words, most patients recover. It would not be fair to assert that recovery is absolute. It is possible that a chronic latent type of the disease may sometimes persist, but it is more reasonable to suppose that the inflamed organs may suffer some impairment of vitality and invite disease in adult life. In this connection we are discussing only the acute type of nephritis and will mention the chronic form later. In mild cases, recovery is spontaneous, treatment consisting of rest—rest of the patient in bed and rest of the kidneys by suitable diet. In severe cases, active treatment is required; the kidneys do not function and other organs must be made to function for them. We have no specific remedies. The vicarious functions of elimination are hot baths or hot packs, which answer equally well, catharsis, and colonic irrigation. In addition the hyperemia of the kidneys may be counteracted by dry cupping over the loins, followed by poultices. Since the common installation of electric lights in houses, it is possible to employ electric light hot baths. In giving cathartics we must avoid those which irritate the kidneys during elimination and to be on the safe side, should depend on phenolphthalein, citrate of magnesia, cascara, rhubarb, and compound licorice or jalap powder. Sodium compounds, because they tend to increase edema, are contraindicated.

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The question of diet is all important, but there have been and still are notable differences in opinion and practice. The general tendency is to give too much of both liquids and solids, the former upon the theory that the kidneys must be flushed out, and the latter for fear the patient will become weakened. It is very probable that hunger and thirst cures, by giving the kidneys absolute rest, are quite rational procedures in theory, although hard to carry out. Remarkable recoveries have been seen under such circumstances in which no other measures were used. After the prolonged rest the kidneys suddenly resume their functions. Probably the tendency is to give too much food and drink early in the disease, and too little in the subacute and convalescent stages. During the early days of the severe cases in which marked anuria and edema exist, the intake must be very restricted; even water and milk will not be eliminated, most of the fluid remaining in the tissues to increase edema. This was shown conclusively by Von Noorden, who discouraged the free ingestion of milk, long believed to be the best management of the disease. Milk is further objectionable because it is a vehicle for an excess of protein and also because of its sodium content.

Goepfert and Langstein (1) classify nephritis under three types, acute nephrosis, glomerulonephritis, and chronic nephritis. In the United States the distinction between nephrosis and nephritis is less emphasized.

Nephrosis occurs mostly in diphtheria and cholera infantum. The main histological change is a mild degeneration of the tubules with a marked retention of chlorides and water, but there is no hypertension and nitrogen retention is not marked. Glomerulonephritis follows mostly scarlet fever and angina, where there is some destruction of the glomeruli, occasional hypertension, at times bloody urine, the kidneys might eliminate some water but excrete salt and nitrogenous substances with difficulty. Uremia may follow these cases.

Diet in nephrosis, according to the above named authors, should be liberal, the chief care being to keep down the saline content of the food. The patient may eat bread and butter, vegetables, potatoes, rice, zwieback, fruit, meat and cheese. Most uncooked food is fairly free from saline matter. Half a litre of milk may be given daily, about twelve hundred to fifteen hundred grams altogether in twenty-four hours. Diuretin, one to two grams daily, may be given to antagonize edema.

In glomerulonephritis, the amount of protein should not exceed one and one-half grams to the kilo of body weight, or about ten grams daily, not more than one-third of a litre of milk. The bulk of carbohydrates may be given in the form of lactose about one hundred and fifty grams daily. For not only does this substance furnish the caloric requirement but also acts as a diuretic. Other ingesta comprise thin cereal soups, fruit juices, rolls and butter. If the stomach is intolerant, withholding food for twenty-four to forty-eight hours is advisable. At times, even water or cracked ice is not retained, in which case water should be administered by the Murphy drip method by rectum, or

three to four ounces, hypodermically. Four or six ounces of a seven per cent. solution of glucose may also be given by hypodermoclysis twice daily.

If we assume that the child is out of danger and that the kidneys have begun to function, there should be a gradual return to the normal diet, but an exclusive milk regimen is not desirable from any viewpoint. As a rule the child does not like it, and, moreover, it often actively disagrees. It seems to predispose to autointoxication and bacillary infections and retards convalescence. Some milk may be taken with bread or crackers, cereals, milk toast, rice pudding, coffee or cocoa, baked apples, oranges, grapefruit and lemonade. Meat broths should be reserved for a later period.

If, on the other hand, the case goes on to uremia, or what appears to be such, we must bear in mind that other intoxications—notably acidosis—may cause much the same symptoms. In acidosis there may be suppressed urine, vomiting, prostration, somnolence and coma. Laboratory examination of urine by the discovery of diaceturia, etc., should prevent such an error, and at the bedside there would be acetone on the breath, and hyperpnea—a deep and exaggerated inspiration and expiration, not very rapid and without cyanosis. In passing, I may remark that in any condition of supposed suppression of urine, the bladder area should be percussed, to exclude retention. Conversely, uremia may develop in the presence of free urination and normal output of urine. The laboratory man will, of course, indicate the percentage of urea in the twenty-four hour sample. Normally it should be from two to two and one half per cent.

For the high blood pressure of uremia, several doses of nitroglycerin should be given—one three-hundredth to one two-hundredth grain hourly. In convulsions, bromides and chloral should be followed, if necessary, by morphine, and if this fails to control, by lumbar puncture. As a last resort and very cautiously, chloroform inhalations should be used. In spinal puncture, a test tube of fluid should be withdrawn, which method has been used successfully in uremic headache. Venesection is indicated at the first appearance of pulmonary edema. From a child over five years of age from three to six ounces of blood may be taken. If leeches are used, one leech will withdraw ten c.c. of blood and as much more will flow from the wound. Hence if six are used—three over each kidney—the total amount withdrawn should be four ounces. If much blood is withdrawn, saline infusion of one hundred to one hundred and fifty c.c. should at once follow, the intravenous method being preferable.

But in case the patient with uremia or with threatened uremia has a low blood pressure with cyanotic tendency and cool extremities, nearly all of our resources are contraindicated. Hot baths and packs, venesection and leeches, pilocarpine—if one is in the habit of using it—must all give way to a stimulant plan of treatment, camphor, digitalis, and similar preparations. Regular pulse with increased tension gives a favorable prognosis, other things being equal; but low blood pressure and arrhythmia are bad prognostic signs. In these cases there is always the possibility of collections of fluid in the large

serous cavities, pericarditis, and cardiac dilatation, which affect the prognosis unfavorably.

Concerning chronic nephritis of early life, according to systematic writers there are at least four clinical types of this affection, two of which are so uncommon that they may be left out of consideration. These are respectively chronic interstitial nephritis and a form of chronic nephritis associated with infantilism. The two common types are both of the nature of chronic parenchymatous nephritis and of these the most common and best known are the moderate and severe types, differing in no respect from the same disease in the adult. This may also be left out of consideration under the circumstances, so that there remains for discussion only the so-called benign or mild type of chronic parenchymatous nephritis which is peculiar to early life. This is a very common affection, although less common than the preceding. It doubtless ends in recovery in the majority of cases, under proper management, and perhaps often spontaneously. It would end favorably perhaps in all cases, were it not for the fact that exacerbations occur from a variety of causes and at times serve to transform the mild into the severe type; or, failing in this, to prolong indefinitely the duration of the disease. As a rule, in chronic nephritis irrespective of type, an acute attack is succeeded by a subacute stage which may persist for about a year, after which it is termed chronic. In the form under consideration this order may be reversed and a mild chronic lesion may light up into an acute one or become, as stated, of a more severe type, in either case through various degrees of exacerbation.

In the mild type of chronic nephritis the child presents no definite symptomatology until the urinary examination is reached. He belongs simply to the undernourished type—pale, thin, and underweight, with poor appetite and little energy. Examination of the urine shows some albumin with formed elements in the sediment. There may be a few casts. Red blood cells should not be present, save in acute exacerbation. These findings are quite sufficient to make the diagnosis after orthostatic albuminuria has been excluded by a day or two of rest in bed. It must be remembered that a few formed elements may also occur in the latter condition. In following up these cases, evidences of exacerbation are often seen either in response to an infection, an act of exposure and perhaps from medication or dietetic errors. The albumin in the urine will then be increased and some edema appear about the ankles, while the amount of formed elements will also be augmented and red blood cells will appear. It should be added that exacerbations may appear without any evidence of an exciting factor.

In these cases no diagnosis is complete without blood and urine chemistry and some method for estimating the efficiency of the kidney. Blood chemistry is of importance because there are cases where the amount of urea excreted in twenty-four hours may be normal and the concentration of urea in the blood may be very high. Dr. Hill, of Boston, finds that two tests will cover all the requirements of rapid and efficient means to determine the functional capacity of the kidney. One is the phthalein test,

which has no decisive value if high (because even with eighty or more the kidneys will be damaged), but it is very valuable if persistently low—say below fifty-five or sixty—indicating then badly damaged organs. The other is the Mosenthal two hour test, so-called, in which the specific gravity alone is measured and differences noted between the high and low readings. In this test, the kidneys are always roused to action by throwing work on them. Usually the patient is made to consume (for a brief interval only) an excess of protein—more than is allowed in his diet. Some pediatricists would not use animal proteins in this test, but this caution is probably unnecessary. One gram of salt and two grains of benzoate of caffeine are used to stimulate the renal secretion. In the normal child the differences between the highest and the lowest specific gravities should average eight, while in damaged kidneys they should not be more than one or two.

Another concentration test worth mentioning and easy to carry out is to keep the child the entire day on dry food only (no cereals nor fluids). Collect day and night urine separately. In normal concentration there is a diminution in the amount of urine secreted and a marked increase in the specific gravity up to a 1.030 and over. If there is interference in the concentration, the diminution in the amount of urine is not very marked and the specific gravity will hardly rise to 1.010. The above mentioned functional kidney tests are of great assistance in outlining a diet and the amount of fluid to be allowed.

The treatment is one of complete rest and proper diet with the avoidance of everything which could possibly cause an exacerbation. Diseased teeth and tonsils should be removed and the surface systematically protected from chilling. The question of bathing is a difficult one, but cool baths are in general condemned and in some subjects even tepid baths may be contraindicated. It is hardly practicable to speak of avoiding measles and influenza, although everything possible should be done to prevent exposure to these diseases. If one of these affections or even a bad cold is contracted it may mean an acute exacerbation. The diet should be liberal, with meat once a day. There is no need to make the diet salt poor, but if the child has a craving for salt it should certainly be discouraged. There is a prejudice against meat broths, which may not be rational, but Dr. Hill does not allow them, as they do no good and the patient gets the benefit of the doubt. Water can be drunk freely and there is no prejudice against milk, while there is no ban on fish and eggs. General tonics, especially iron, should be given steadily.

These children should recover, barring accident, in the space of several years. Disappearance of albumin from the urine is no criterion of recovery and reliance should be placed on the negative phthalein and Mosenthal tests and the absence of formed elements and casts in the centrifugalized sediment. The younger the subject, other things being equal, the better the prognosis.

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50 EAST NINETY-SIXTH STREET.

Artificial Feeding of Normal Infants*

By WILLIAM L. ROST, M. D.,
New York.

Although somewhat reluctant to approach a subject about which so much has been written, I feel sure that the observations made in a large clinical experience will be helpful. All fairminded persons readily concede that fads and fancies are observed in the practice of medicine and infant feeding has undoubtedly come in for a great share of this instability; apparently the final word has not been said on this most interesting subject.

Time was when those clinicians who believed in and fed high fat formulas condemning the protein, held sway; then along came observers of equal clinical distinction who asserted that the fats and sugars were the disturbers of peace in artificial feeding; finally others were convinced by clinical experimentation that cow casein was not only tolerated by well children, but that infants with gastrointestinal disturbances were benefited by the administration of a mixture rich in cow casein and relatively low in fat, sugar and salts. These diverse opinions and observations helped not a little to confuse the general practitioner when he was confronted with the problem of artificial feeding. He had been taught at college that high fat and low protein were best suited, but unfortunately he had heard a paper read at a medical meeting condemning this method and suggesting the employment of whey mixtures. Another advised and recommended the memorizing of various tables and formulas he found beneficial. Still another authority insisted that artificial formulas must approximate mother's milk, this necessitating a knowledge of the various percentages of top milk and cream mixtures. His perplexity was increased as he learned of the various malt preparations, dry milks, evaporated milks, and buttermilk and corn syrup mixtures that were used by the experienced clinician, with excellent results. He found himself in a maze and finally gave up in disgust; I do not blame him.

Infant feeding cannot be taught, therefore no attempt will be made in this brief discussion to do more than to give in a concise and simple way the fundamental principles involved and some practical suggestions that have been found useful. One must remember that the art of infant feeding can be acquired only by constant application to this branch of medicine and that a large clinical experience is of paramount importance. It is for this reason that I am of the opinion that the general practitioner should take charge of the normal cases only and those infants who manifest the slightest pathological disturbance should be referred to one of qualified clinical experience.

During my college days Dr. John O. Polak, of Brooklyn, obstetrician and gynecologist, used to insist that all he attempted to do with his pupils was to teach them safe obstetrics; by that he meant that if the doctor was unable to cope with his case he should recognize this early and seek aid before it

was too late. I take this as my text and make a plea for safe infant feeding.

The obstetrician, as well as the general practitioner, are the first to observe the infants from birth and it behooves them to familiarize themselves with the ordinary principles of infant feeding if they are to attempt at caring for these future citizens. They must learn to appreciate what delay and procrastination means when an infant does not take kindly to the formulas that may be prescribed. Do not wait to consult or refer the cases when severe dyspepsia has developed or the infants have become atrophic or are suffering from an acute alimentary intoxication, which in the majority of instances means death. Seek aid just as soon as there is the slightest variation from the normal if you wish to do justice to your patients and save life. I am making this plea in behalf of those little patients who do not need rhubarb and soda and calomel and frequent bowel washings when they are suffering from the results of improper feeding.

It is now well recognized that practically all the digestive ferments are present in the newborn and very young infant; some of these ferments are only mildly active at birth; very soon, however, the infant learns to take care of a fair amount of carbohydrate in the form of cereal decoctions and even well cooked gruels; therefore the infant is prepared to digest fats, protein, carbohydrates (sugars and starches), salts and water.

It is also well established now that cow's milk cannot under any circumstances be made to approximate human milk because of the biological differences; the best that we can do is to give cow's milk in such dilution and quantity as experience has taught us is safe for an infant, at a given age and of a given weight. The prerequisites for a baby to thrive on are the following: 1. It must receive the proper quantity of food calculated in food calories in proportion to its body weight. 2. The food must contain the proper elements (fat, protein, carbohydrate, salts and water) to maintain nutrition and allow for growth, and it must be assimilable. The fats supply heat and energy, add to the body weight by storing up fat, and save nitrogenous waste. The proteins are essential for cell construction and the replacement of nitrogenous waste. The sugars supply heat and energy and replace fat waste or fat deficiency. The salts are essential to growth and development of the tissues of the body and enter into the various chemical reactions of the food and body fluids.

While the composition of human milk gives us a guide as to the digestive capacity of infants, in attempting to feed cow's milk in composition resembling mother's milk, a great deal of trouble due to fat indigestion has been experienced by some clinicians, while others say they have observed no untoward effect in certain normal infants. After studying both sides of the question, and from our

*Read before the Bronx County Medical Society, May 18, 1921.

own experience with a large number of infants of Jewish, Italian, German and Irish parentage, we have come to the conclusion that simple dilution of whole milk making up the deficiency in sugar is safest, simplest, best tolerated, gives the least digestive disturbance, and is readily taken up by the average mother. The latter is by no means a negligible factor in the success of infant feeding.

In order to make clear our conception of this subject it is well to consider the differences between human and cow's milk.

HUMAN MILK.

Fat	.....	4.0	per cent.
Protein	....	1.5	per cent., casein 0.5 per cent.
Sugar	.....	7.0	per cent.
Salts	.....	0.2	per cent.

COW'S MILK.

Fat	.....	4.0	per cent.
Protein	...	3.5	per cent., casein 3.0 per cent.
Sugar	....	4.75	per cent.
Salts	.....	0.7	per cent.

Both are amphoteric in reaction when they leave the breast; cow's milk is usually acid by the time the baby gets it; human milk is practically sterile, while cow's milk is not. The fat emulsion is finer in human than in cow's milk; the greatest proportion of protein in human milk is lactalbumin, while in cow's milk it is the casein. The enzymes of the two milks are different and each has a specific serum reaction. Water is the simplest diluent and lactose is the natural sugar; cane and malt sugar are also well borne by healthy children; there is, however, some difference in their effect, which makes it at times desirable to use one in preference to the other.

Milk sugar does not ferment with yeast and is not readily broken down in the stomach, hence in infants who vomit it is preferable to cane or malt sugar. It is slightly laxative and is usually well borne by healthy infants in amounts up to seven per cent., beyond this diarrhea is likely to occur; it is badly borne by infants with a tendency to looseness of the bowels. Cane sugar is mainly used because of its cheapness. It is likely to set up alcoholic fermentation and may cause vomiting, but some infants thrive on it.

Malt sugar is rarely used on account of its expense; the preparations most commonly employed are combinations of maltose and dextrin. In these preparations we have a combination of polysaccharide dextrin and a disaccharide maltose; maltose is a crystalloid, fermentable and dialyzable, while dextrans are reversible protective colloids, nonfermentable and nondialyzable; both are eventually absorbed as dextrose. The advantage gained in the use of these sugars lies in the fact that maltose is readily absorbed and dextrin, through its protective action, aids in the assimilation of the cow's milk; there is slight increase in the water retention, the combined action resulting in a more rapid gain in weight. When the proportion of maltose is greater than that of dextrin, the laxative effect is increased; as a rule more of this sugar can be given than of the others without causing gastrointestinal disturbances.

The starches act as protective colloids, and in this way prevent the formation of tough curds. Those most commonly employed are barley, oat-

meal, and imperial granum; barley is slightly constipating while oatmeal is somewhat laxative; the reverse of these effects has been observed in some infants. After the second month the majority of infants can tolerate cereal decoctions used as diluents, and at six months the average infant can digest well cooked gruels. The starches may be utilized advantageously where there is a diminished tolerance to sugar or fat, so as to make up the deficiency. In those children who have some difficulty with casein digestion, boiling the milk is the simplest means at our command to prevent tough curd formation. The addition of cereal decoction or an alkali such as sodium citrate, two grains to each ounce of milk in the formula, will hinder the formation of large curds.

Having discussed the several principles of practical importance, let us now apply them in a practical way.

1. How to determine what to give.
2. How much at a given time.
3. At what intervals.

In prescribing a given formula the directions must be specific and should be written or printed plainly. The best milk obtainable (certified raw milk preferably) should be used and some fruit juice (orange, pineapple, tomato, grapefruit, prune) should be given after the sixth week; beginning with small amounts diluted with boiled water and gradually increasing up to one or two ounces daily.

To determine a given formula according to the method suggested, it is well to know that one ounce of average cow's milk has a caloric value of 20; one quart of whole milk about 640 to 670; one gram of fat 9.3 calories, and one gram of sugar, starch, or protein 4.1 calories.

Careful energy metabolism experiments carried out by Rubner and Hoebner, Benedict and Talbot, Holt and others have shown that the average normal infant in order to thrive requires about fifty to sixty food calories to the pound of weight up to six months of age, after that from forty-five to fifty. Very active babies require more because they use more; fat, lethargic infants require less because their metabolism is less active and little is used up in energy. Experience has taught that an average baby requires from one to one and a half ounces of sugar in twenty-four hours; this represents 120 to 180 calories. Given an infant four months old weighing thirteen pounds, the approximate caloric requirement would be 650; deduct the amount of sugar, 180 calories, leaving 470 calories to be supplied in the form of whole milk, or about twenty-four ounces. The average four months old infant will take about seven feedings of from five to six ounces, making a total of about forty-two ounces; of this, milk represents twenty-four ounces, diluent eighteen ounces, and sugar one and a half ounces.

When beginning artificial feeding it is advisable to feel your way, give less than the calculated amount until you have determined the tolerance of the patient, and then gradually work your way up. As a safe although not invariable guide, we would suggest up to two months of age about one third milk and two thirds diluent; from two to

four months half milk or a trifle over; from four to six months twice as much milk as diluent; from six to nine months three parts of milk and one of diluent, or even whole milk undiluted.

The amount of a feeding will vary with the size of the infant; some will take two and a half to three ounces the first month, others more; after the second month a safe rule is to feed from one to two ounces more than the age in months, the maximum being about eight ounces—I know that some of our ablest clinicians feed ten ounces or more at one feeding, but in our experience we did not find this necessary. Very young and small infants may require feedings every two or two and a half hours the first month or two, some will thrive very well on a three to four hour schedule;

judgment and careful observation are necessary. Hard and fast rules as to the exact intervals of feeding are irrational because of the variations in some babies of the gastric motility and the amount consumed. It is also well to remember that cow's milk remains in the infant's stomach longer than mother's milk.

To summarize, we in our experience have found it preferable to employ whole milk dilutions, using the caloric method as a check, for the following reasons: 1. It is simple to carry out. 2. Infants thrive better and have less gastrointestinal disturbances. 3. It is more adaptable to the average household. 4. The ready cooperation of the mother because of the simplicity.

2001 GRAND CONCOURSE.

Clinical and Therapeutic Observations on Biliary Disorders in Children

By J. EPSTEIN, M. D.,
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Jaundice of the newborn or *icterus neonatorum* is the first biliary disorder in early life. Statistics from maternity hospitals indicate that about seventy-five per cent. of the newborn become more or less jaundiced on the third or fourth day after birth. This discoloration is transitory, lasting from a few days in the majority of cases to a week or two in some cases, finally clearing up without therapeutic help. The infant does not show any evidence of ill health, the digestion is good, and there are usually no abnormal changes in the color of the urine and feces.

The etiology of this early biliary affection is not definitely known. It may be due to an excessive biliary secretion, with an imperfect drainage through the narrow infantile bile ducts, or to an erythrocytolysis which, in turn, causes an increase in bile formation and an absorption by the general circulation. The erythrocytolysis may be considered as part of the general anatomical and physiological changes that take place in the newborn during the period of transplantation from intrauterine to extrauterine life.

This icteric manifestation must be differentiated from *icterus* due to sepsis, syphilis, hereditary family jaundice, Winckel's disease, and congenital obliteration of the common bile duct. In sepsis there is fever, prostration, and the underlying focus of infection which can be frequently traced to the umbilical region. Syphilis can be diagnosed by the parental history, the fate of previous pregnancies, the symptoms and signs of lues in the infant, and by the Wassermann test. Hereditary family jaundice may be diagnosed by the familial history, the variable degree of jaundice, the absence of bile from the urine, its presence in the feces and by the fragility of the red blood corpuscles. Winckel's disease is rare and is characterized by intense jaundice,

cyanosis and hemoglobinuria. Congenital obliteration of the common bile duct becomes evident from the constantly increasing jaundice, the exclusion of sepsis and syphilis, the occasional subcutaneous and submucous hemorrhages, and the enlargement of the liver and spleen.

Icterus neonatorum requires no treatment. In septic jaundice the underlying infection must be treated. Syphilitic jaundice will clear up under antiluetic therapy. For familial jaundice the treatment is merely symptomatic, while Winckel's disease and congenital obliteration of the common bile duct are beyond therapeutic help.

After this infantile jaundice there is a period of comparative freedom from biliary disturbances till the child reaches the age of three or four years, when jaundice is again prevalent. This second period of biliary disease coincides with the period of the exanthematous diseases. At this age, the jaundice is commonly known as catarrhal jaundice. The diagnosis is usually simple because those pathological processes which cause jaundice in early life are not present at this age; the cholecystitis, cholelithiasis, hepatic cirrhosis, and malignant growths, which are the cause of jaundice in adult life, are too rare in childhood to be of etiological importance.

The cause of this biliary affection is not known. It is a cold wet weather disease, occurring mostly during the cold rainy season and occasionally manifesting itself in epidemic form. Some infection or intoxication is undoubtedly the cause. Gastroduodenitis with an ascending infection through the common bile duct is thought to be the cause of catarrhal jaundice, but gastroduodenitis is of frequent occurrence in children without the complication of jaundice. It is a common digestive disorder, uninfluenced by seasonal variations, and does not affect children in large groups. If gastroduodenitis

should be accepted as the etiology of catarrhal jaundice, it must then be assumed that it is caused by a special type of organism as yet unknown. It is also probable that a hemolytic organism is the cause of this hepatobiliary disease. This organism causes a destruction of many red blood cells and a liberation of a great many infected hemoglobin fragments, which are used as bile material, with the consequent infection and obstruction of the biliary channels. Whether the infectious process along the biliary tract is an ascending or descending one, catarrhal jaundice is evidently not a local disease but a general infection with the hepatobiliary system mostly involved.

From an observation of a large number of children with catarrhal jaundice, I was impressed with the fact that the disease runs through three stages or periods. There is a short but indefinite period of incubation during which time the child is not as well as usual. It is restless, fretful, refuses food, and many have some fever, but there are no definite symptoms or signs. This is followed by a well marked period of invasion lasting two or three days. The child looks ill, sore throat is frequently complained of, and almost all have abdominal pain and general aching. Slight chilliness and more or less fever are present in the majority of cases. Then comes the third or icteric period which lasts from two to three weeks. The child complains of abdominal distress after eating, the appetite is poor, there is occasional vomiting and marked constipation. Some children complain of 'dizziness. A slight afternoon rise in temperature is always present and the pulse, unlike that in adult jaundice, is not slow but may be irregular. The skin may be of all shades of yellow and the child complains of severe itching. The urine is laden with bile and the stools are clay colored. There is a large tender liver and a palpable spleen. This characteristic third period is frequently followed by a definite posticteric fourth period during which time there are often attacks of intestinal indigestion, the appetite is poor and the bowels irregular. The child loses weight and becomes anemic. This fourth stage or period, which may last for weeks, is probably due to some structural or functional disturbances of the liver or pancreas and is a sequel to the acute inflammatory process.

This clinical observation of jaundice in children, extending over several years, which during certain winter seasons assumed epidemic proportions, makes it quite evident that it is a systemic disease. The infection invades the body either through the upper intestinal tract or through the pharyngotonsillar region, finally selecting the liver where it causes structural and functional changes resulting in hepatocholangitis with jaundice. The infection probably extends to the gallbladder and pancreas and is the cause in many cases of chronic intestinal indigestion. It may also have some etiological relation to cholecystitis, cholelithiasis and pancreatic disorders in later life.

Mild cases of catarrhal jaundice are frequently not properly diagnosed and the patients are treated for all kinds of gastrointestinal disorders. These children usually complain of headache and abdomi-

nal distress after eating. The bowels are constipated and there is occasional nausea and vomiting. Not uncommonly there is daily morning vomiting. A careful examination will show the conjunctivæ and skin to have an icteric hue, the tongue coated, the liver slightly enlarged and tender, and the urine and feces indicative of jaundice. Many cases of periodical vomiting and obscure metabolic derangements, which are commonly diagnosed as acidosis, may be found on careful examination to be cases of hepatic toxicosis or cholemia, due to a dysfunction of the hepatobiliary system.

A functional deficiency of bile may be diagnosed in certain cases. These children show a persistent fat intolerance and various dyspeptic manifestations. There is a peculiar sallow tint to the skin, the stools are light colored, and there is no bile in the urine.

While in the majority of cases catarrhal jaundice runs a benign course, it is not as harmless a disease as it is usually thought to be and it should be accorded more diagnostic study and therapeutic care. An apparently mild case may progress to a more severe type. The biliary inflammation may extend to the gallbladder and pancreas and cause either immediate complications or serious sequelæ.

The usual treatment is very unsatisfactory. A few perfunctory remarks about diet and a bottle of rhubarb and soda mixture is all that the child gets. Acute catarrhal jaundice or acute catarrhal cholangitis is an acute infectious disease and it should receive the same therapeutic care as any other infectious disease. The entire digestive and metabolic system is probably affected in this hepatobiliary disease, because the task of the liver is not only to secrete bile but it has also glycogenic, lipogenic and urea forming functions. The bile is essential in the digestion of fat and probably has a stimulating effect on intestinal and pancreatic secretions.

Every jaundiced child should be kept in bed till the jaundice has entirely cleared up. The diet should consist of proteins with a small amount of carbohydrates and a minimum amount of fat. Frequent drinks of warm alkaline water are very useful. This can be prepared by adding a half teaspoonful of bicarbonate of soda, sodium phosphate, or sodium sulphate to a glass of warm water. The bowels should be kept open, preferably with milk of magnesia. A powder made up of pancreatin, salol, and sodium bicarbonate, taken three times a day after meals, I have found very efficacious. Warm applications to the hepatic region and a daily warm bath do much good.

As a therapeutic experiment, I have used some of my jaundice patients as controls and have treated them according to the prevailing idea of little or no care, while the others were confined to bed and given the proper general care, diet and medication. The results fully justified the care and trouble of keeping an unwilling child in bed. In those children who were kept in bed the duration of the illness was much shortened, there was little gastrointestinal upset, the itching of the skin was not so distressing, and there was no aftermath of various complicating effect on the intestinal secretions.

213 EAST BROADWAY.

The Prevention of Contagious and Infectious Diseases in a Children's Orthopedic Ward

By WALTER G. ELMER, M. D.,
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A children's ward in a general hospital is likely to be under quarantine several times during the year, as it is exceedingly difficult to prevent the introduction of contagious disease with the incoming children. The period of quarantine may vary from one to three weeks, during which no children are admitted or discharged. If a disease like measles or mumps finds its way into the ward there may be a quarantine lasting six or eight weeks. Scarlet fever is most difficult to eradicate if the infection extends to several children. In any case the child must be removed to an isolation building and the ward quarantined for a reasonable period.

This naturally results in a considerable loss, as a number of children must be fed and cared for that would otherwise have returned to their homes, and children seeking admission must be kept waiting. Sometimes children are brought long distances by their parents and on arriving at the hospital discover that the children's ward has been quarantined and they must return home or go to another hospital. In a teaching institution the disadvantages are still greater, as the students are deprived, to some extent at least, of the advantages of practical and clinical instruction in the ward, and the regular operating clinics are also restricted.

A children's orthopedic ward of thirty-three beds in one of our general hospitals had been quarantined from time to time, sometimes for a month or longer, and this so seriously interfered with the teaching courses that I endeavored to find some plan by which we could as nearly as possible eliminate the contagious and infectious diseases. It did not seem possible to control scarlet fever but I felt that most of the others could be prevented. The following plan was adopted:

Children who were brought for admission to the orthopedic ward were examined for any evidence of throat infection, rash on any part of the body, and in the case of the girls, a vaginal discharge. The parents were questioned in regard to any recent contagious disease in the home or school or among the child's playmates. Cultures were made from the nose and throat, and specimens obtained from all the girl children to be examined for vaginitis. If these latter specimens were pronounced negative by the laboratory, the child was admitted to a probation room for five days.

If a child had never been vaccinated, that was done some time during the first three days. Every child was immunized with diphtheria antitoxin in this same period. If over two years of age one thousand units were given and if under two five hundred units. On the second day the reports from the laboratory on the nose and throat cultures were received. On the fourth day a second vaginal specimen was sent to the laboratory. On the fifth day after a careful inspection of the child's body and all

the reports being negative, the child was transferred to the ward. Vaginal specimens were sent to the laboratory each week so that a record might be kept of every girl child during her stay in the hospital. The bed pans were sterilized in a large utensil sterilizer that was used for that purpose alone. When a girl patient asked for a bed pan, the nurse took one from the sterilizer. Every bed pan was surgically clean every time it was used.

This plan has been entirely successful. I put it into effect early in March, 1919, and up to this time, the end of June, 1921, the ward has not once been quarantined—a period of two years and four months. About two hundred children are admitted to the ward each year. More than four hundred and fifty children have been admitted during this period if the usual average has been maintained.

Before putting these rules into effect I considered all the features of the plan very carefully and especially in regard to immunizing every child with diphtheria antitoxin. There may be a little risk in this but it is exceedingly slight, and even that may be practically eliminated by injecting about one drop of antitoxin intradermally and waiting three minutes. If no local reaction occurs, the injection of antitoxin may be given in the usual way.

An alternative to this plan is to use the Schick test on all the children and immunize those that are susceptible by the toxin antitoxin method.

As none of the children during this period has developed a contagious or infectious disease it seems likely that their general resistance to infection has been increased by the diphtheria antitoxin. That advantage would be lost if the Schick method was employed.

Every effort should be made to prevent the entrance into the ward of cases of specific vaginitis as the infection may be transmitted to other children before its presence is discovered. The two forms of valvovaginitis, specific and simple catarrhal, are transmissible. The former may lead to serious results while the latter is comparatively harmless. A child with a vaginal discharge should not be admitted to the ward, but should receive proper treatment until cured. It is difficult to determine when a specific case is cured. If the infection has extended into the uterus it is doubtful if the child can be cured in months, and she may be a carrier for several years.

A child may have recovered entirely from the acute infection and have no discharge and yet a positive report may be returned from the laboratory. Or occasionally a child may give one or two negative results and then a positive smear be obtained. It is the child with no clinical evidence of the infection and yet is a carrier of the infection which must be carefully guarded against, as the nurses or doctors in handling such a child might carry the infection unknowingly to another child. It may happen

that after an operation which requires a considerable amount of manipulation as, for example, congenital dislocation of the hip, the child may within a few days present a vaginal discharge and the smears show the presence of the gonococcus. By careful questioning of the mother it may be discovered that the child had a vaginal discharge two or three years previously from which it had apparently entirely recovered. The unavoidable confusion of the soft parts had lighted up the old infection.

The greatest care should be used in the laboratory examinations and they should be made by an experienced bacteriologist. The failure to distinguish between the true and the pseudodiplococcus may result in confusion and embarrassment to those in

charge of the ward. The gonococcus is decolorized in staining by Gram's method, while the pseudodiplococcus is not.

Adult visitors were admitted to the ward on regular visiting days. Each visitor was provided with a gown which completely covered the clothing. The head nurse used her judgment in regard to the presents which were brought for the children. There seemed to be no objection to new books and toys. Certain of the patients were sent each day to the orthopedic gymnasium during the public clinic hours and no harm resulted from this. So far our plan has been successful, and a period of two years and four months is a very fair test.

1801 PINE STREET.

Intussusception in an Infant Six and a Half Months Old

By SOLOMON ROTTENBERG, M. D.,
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The following case is reported, first, because of the large amount of intestine being intussuscepted; second, because of a previous gastroenteritis being the etiological factor, and third, because of the uneventful recovery following resection of the large intestine.

CASE.—A female child, six and a half months old, normal delivery, weight seven and a half pounds at birth. Was breastfed for the first five and a half months, and during that time had no gastrointestinal disorder. Five and a half weeks ago the mother noticed the baby had diarrhea, with six and seven stools a day, green and frothy, with foul odor. The child was treated for the diarrhea, but the condition persisted, and the child was losing weight. Three weeks ago the family doctor placed the child on Mellin's food and barley water, but the diarrhea persisted.

Present illness.—On February 24th, the mother noticed a slight streak of blood in the stool. The following day the child had six bowel movements, each of which was streaked with blood. On February 29th the child had six bowel movements, each of which was streaked with blood. The mother also noticed that the baby was cold and had marked pallor. It cried all day, and the mother thought it seemed unconscious at times. The baby did not vomit. The family doctor called Dr. Hermann N. Appel in consultation, who made a diagnosis of intussusception and advised immediate operation.

Physical examination.—Female child, six and a half months old, crying, thighs flexed at abdomen. The child showed marked pallor. The general physical examination was negative except that the abdomen was slightly distended. No peristaltic waves were visible. A large tumor mass about the size of a grapefruit was palpable in the left lower quadrant. Pulse was 130, temperature 98°. A mass was felt high up in the rectum, and there was free bleeding from the anus. The blood count showed

white cells, 14,000; polymorphonuclears, eighty-two per cent.

Operation.—Under ether anesthesia a median incision was made. There was an escape of considerable serous fluid and a large tumor was found in the left lower quadrant. The ileocecal junction, the cecum, ascending transverse and descending colon were found invaginated into the sigmoid, which was reduced by milking the intestine out. All of the intussuscepted gut was very much congested and the mesenteric glands of the entire small intestines were much enlarged. At the ileocecal junction there was an ulcer about the size of a quarter which was surrounded by an area of gangrene which showed impending perforation. The lower three inches of the ileum and cecum, and three inches of ascending colon were resected (including the appendix), the ends of the intestine were pursestrung and invaginated, and a side to side anastomosis was done between the terminal ileum and the ascending colon. The abdomen was closed in layers.

Postoperative course.—The child made an uneventful recovery except for a slight stitch infection. On the sixth day, postoperative, the patient's temperature rose suddenly to 103°, which was due to a double otitis media. After a paracentesis, the temperature dropped to normal and the baby went home on the fourteenth day, perfectly well.

Pathological findings.—Specimen of ileocecal junction including appendix, three inches of ascending colon, and three inches of lower ileum. There was an ulcer about two inches in diameter, circular at the ileocecal junction. The cecum surrounding the ulcer was markedly indurated and edematous. The mesentery of the ileum showed patches of gangrene. At the centre of the ulcer there was a spot covered only by serosa with impending perforation at this site. The mucosa of the cecum showed areas of gangrene and hemorrhage. The ascending colon showed no pathological findings.

Editorial Articles

INFANT WELFARE

It is now recognized by the medical profession that on the health of the child hangs, to a large extent, the prosperity, even the existence of a nation. The general public is awakening to a realization of the truth of this statement, with the consequence that the infant welfare movement has received a great impetus. Various societies have been organized, among them being the National Baby Week Council, in the foundation and organization of which Dr. Eric Pritchard has been largely instrumental. A meeting of this council was held in London on May 24, 1921, at which Dr. Pritchard, who is chairman of the executive committee, presided. In his opening address he said that the three special phases of the work of infant welfare which the council was emphasizing were the importance of breast feeding, the urgent need for some scheme of pension for civilian widows, and the prevention of blindness, with special attention to ophthalmia neonatorum. The National Baby Week Council celebrated its fifth birthday during the first week of July and it was suggested that a combined health and baby week be held in Great Britain in October.

Dr. Mabyn Read, medical officer of health for Worcester, presented an address in which he referred to the success of the efforts which had been made in that city to improve infant life. When he was appointed medical officer in 1891, the infant death rate was two hundred and eight in a thousand. During the years 1900 to 1905 the rate was one hundred and five in a thousand; in the next five years it was one hundred and twenty-four; from 1910 to 1914 it fell to ninety-four; in the next five years it was sixty-nine, and last year figures showed the infant death rate to be sixty-seven in a thousand.

Previous to the founding of the Infant Health Society in 1907 there had been no particular public health activities, though some two hundred of the worst houses had been removed; a small proportion, in a total of about eleven thousand dwellings. The Infant Health Society began with one health visitor but in 1910 the city council gave an appropriation to this society and two years later took over the health visitor as a city official. Though a few classes for mothers were held, no clinics were started until 1917, when a woman doctor was appointed, giving half her time to the clinic and half to school work. In 1919 the society obtained a grant from the American Red Cross Society and

established an antenatal clinic. Milk was provided for mothers and children by the city council. In 1913 dinners were given to expectant mothers and a small amount of dental work was provided for, both of these activities being limited by the finances of the society.

An important factor in the progress of the work was the sympathetic cooperation of the midwives, some sixteen of whom attended about eighty per cent. of the births in the city. The opinion prevailing among the mothers now was that it was a disgrace to have an unhealthy baby, and that good results were due almost entirely to home visiting. At present there were four health visitors and an antenatal centre which was kept full constantly by the recommendations of the midwives.

Miss Eleanor Rathbone, of Liverpool, deplored the lack of provision made by the State for babies, motherhood not being recognized as work of public importance. The poverty period of the ordinary working class family usually came at the time when the mother was bearing children and this had serious effects on the health of the race. Nothing could be more wasteful or extravagant than the present system of neglecting mothers and children.

Dr. Leonard Hill said that health, including the health of the baby, was closely connected with the question of coal. With our present wasteful methods of using coal, only about five per cent. of its energy and heat value was utilized, the other ninety-five per cent, merely polluting the atmosphere and setting up conditions which caused ill health. London and other industrial centres, he said, were now experiencing the benefits of unobscured sunlight as a result of coal shortage, and he instanced the advantages of sunlight and fresh air as shown in the results obtained in tuberculous children in Alpine countries where the children ran about covered only with a loin cloth. The effects upon these diseased children were extraordinarily good. If this life and the open air schools were good for diseased children the same conditions should be beneficial for the healthy. He believed that in London there were only two open air schools, while in New York there were over a hundred.

Professor E. L. Collis said that economy consisted in spending money wisely and well and must not be confounded with parsimony. By a long series of enactments in the interests of economy, during the past hundred years, the country had been nationalizing the care of health. The first test of

spending money wisely was the return of the expenditure. On the credit side was the productive activity, mental and physical, of adult members of society. The results of nationalizing the care of health, however, were not as yet the most economical. In order to have a healthy nation the first need was healthy babies. The standard of health of children at birth was fairly satisfactory and should be maintained or improved. Girls in school should be taught mothercraft. Money spent on health visitors was true economy. It was cheaper to spread a knowledge of fresh air and cleanliness than to patch up casualties in sanatoriums and dispensaries.

In the brief discussion which followed, reference was made to the need of better housing conditions and for supplying children with pure milk in the interests of sound health.

PATHOGENESIS OF POSTOPERATIVE LEUCOCYTOSIS.

If there is an interesting question to study it is certainly that of the various causes giving rise to leucocytosis after surgical operations in general. Why do reactions take place after aseptic surgical acts of the same order as in infectious diseases strictly speaking? Polynuclear neutrophile hyperleucocytosis follows both aseptic and septic operations and occurs in infectious diseases as well. According to Schultze, hyperleucocytosis is merely apparent; it is due to the fact that the leucocytes accumulate in the deep capillaries and afterward emigrate to the superficial capillaries. This theory is both insufficient and inexact and it is enough to examine the rich leucocytic content of the central and superficial capillaries to perceive that there is a real increase in the leucocytes. Roemer and Buchner state that this increase may take place directly in the blood and as proof they refer to the leucocytic masses described by Everard, Demoor, Massart and others, but the latter observers look upon them as leucocytic thrombi circulating in the blood. Schwer and Löwy's theory can only account for leucocytoses without a local focus, so that Metchnikoff's conception is not generally accepted, which attributes the polynuclear leucocytosis to a chemiotaxic action of the bacteria, as well as various substances circulating in the blood.

However, observation tends to show that the process is of a yet more general order and may be produced by various factors, as postoperative leucocytosis proves. Buchner remarked that certain principles resulting from the destruction of tissues or transformation of albumins enjoy the same

properties, and the trauma of the surgical act is undoubtedly itself of a nature to provoke the formation of substances capable of engendering polynuclear neutrophile hyperleucocytosis. Therefore, it may be supposed that operative trauma in itself, no matter how aseptic, may cause reactional leucocytosis due to the transformation of the albumins of the traumatized tissues.

But chemiotaxis itself is not enough to explain all, and it may be said that these substances act on the hematopoietic organs themselves and thus provoke the passage of the leucocytes into the circulation. We know only too well that absolute asepsis is rarely, if ever, realized, so that even the most minute infection, clinically imperceptible, may cause an increase in the white blood cells. Animal experiments confirm these considerations, so that in our so-called aseptic operations the trauma of the tissues probably alone acts in the production of the leucocytosis. It is impossible to carry out a surgical act without manipulating the tissues to some extent and the handling places the tissues in a state of lowered vitality and it may very likely be that these tissues are capable of engendering toxins, the products of cell disintegration.

The slight mononuclear development following postoperative polynucleosis may be due to the necessity of the organism to elaborate substances capable of reacting against the products derived from the albuminoids in order to neutralize and destroy them. However, the quantity of this antitoxin must be very minute because the mononuclear reaction is also trifling and may be in direct ratio to the power of the substances elaborated during the polynucleosis phase. As to the mechanism of the eosinophilia and basophile leucocytosis, their genesis is still obscure.

Levaditi has pointed out that in infections there is a balancing between the eosinophiles and neutrophiles; for example, there will be an eosinophilia with a maximum polynucleosis and a minimum polynucleosis with maximum eosinophilia. It would seem that the chemiotaxic substances reject the eosinophiles and attract the neutrophiles. The former possess the phagocytic reaction but their appearance at the close of the disease shows that their function is to eliminate detritus accumulated in the organisms during the initial phase of the process. Loeper has supposed that possibly the eosinophiles carried substances for repair into the focus of disease.

These theories are interesting but are yet merely hypotheses. There is one certain fact, however, that has been proved by Bouchez and that is that eosinophiles are usually the index to convalescence.

Basophile leucocytosis—mastzellen leucocytosis—appears to follow the same laws as eosinophilia and they likewise appear to be endowed with the same chemiotaxic sensibility and may engender an active leucocytosis.

PHYSICIAN AUTHORS: JOHNSTON,
COWLEY AND CHAMBERLAYNE

The earliest British physician author of whom we have any record was Dr. Arthur Johnston, the Latin poet, born in 1587, near Aberdeen, Scotland. If there were any before Johnston's time, they were not of sufficient importance to be mentioned in any of the standard histories of English literature. Up to the time of Shakespeare (1564-1616) about ninety per cent. of British authors were churchmen of one sort or another. Prior to the Norman Conquest and for a long time thereafter the churchmen seem to have had practically a monopoly of authorship. It was not until the sixteenth century that men of other professions began to enter the profession in any considerable numbers, and even then the physicians with literary ambitions seem to have been few. A few years before Johnston's death, in 1641, Abraham Cowley, who got a medical degree at Oxford on December 2, 1657, began to be popular as a poet, and then came William Chamberlayne, another poet who also was "a doctor of physick." These three were the pioneers, with the possible exception of some inconsequential representatives of the profession.

Johnston was perhaps the best physician of the three—certainly a much better physician than Cowley—and his literary reputation has stood the test of time better than that of the other two. Samuel Johnson praised him as "one of the best of the Latin poets" and later critics have endorsed this opinion. He wrote a collection of Latin epigrams and elegies, a Latin paraphrase of the *Song of Solomon*, a collection of short poems (1637) and a complete Latin version of the *Psalms*, his greatest work. He began his medical studies at the University of Aberdeen, afterwards going to the University of Padua, then the scientific centre of the world, where he got his M. D. degree. Instead of returning to Scotland, he began practising in Paris and remained there nearly forty years. Upon his return finally to Aberdeen he became principal of the University, but soon went to London to practise and became physician in ordinary to Charles I. He remained in London in practice until his death.

Abraham Cowley's connection with the medical profession seems to have been rather slight. Various biographical sketches of him say he obtained his degree "by an order from the government,"

evidently for some political purpose, but the biographers are somewhat hazy as to what this political aim might have been. Cowley was an ardent Royalist and a great friend and assistant of Charles I, going to Paris on diplomatic missions for him and otherwise aiding the cause of the king. When he died, July 28, 1667, he was buried with great pomp in Westminster Abbey, near Spenser and Chaucer, and Charles II said at his grave, "Mr. Cowley has not left a better man behind him in England." The reticence of the biographers as to Cowley's medical degree also applies to his practice. Beyond saying that after he had his degree he went to Kent "to pursue the study of simples" they are silent. He was thirty-nine when he got the degree and died in his forty-ninth year.

Cowley's is a dead name in literature today, at least so far as his poetry is concerned, though in his day he was even more popular than his contemporary, Milton. "During all of Milton's lifetime his fame was obscured and dwarfed by the exaggerated reputation of this writer," says Edmund Gosse, who professed himself to be the last of Cowley's admirers and contended that Cowley's utter obscurity and neglect were far from wholly deserved. Cowley was one of the child prodigies of literature. His first volume, *Poetical Blossoms*, appeared when he was fourteen years old. One of the poems was *Pyramus and Thisbe*, based on the old Babylonian legend which Shakespeare caricatures in *Midsummer Night's Dream*. This was written when Cowley was ten years old and Gosse calls it "an extraordinary piece for so young a child . . . a work which few of the adult poets of that day would have been ashamed of writing." Among his more mature works were *The Cutter of Coleman Street*, a dramatic satire; *Davidis*, an unfinished epic based on the life of King David; *Love's Chronicle*, *The Mistress* and other poems. Although his poetry is no longer read, Cowley still has some vogue as an essayist. His essays, incidentally, were written after he had retired to Kent to study simples, which seems to have been the extent of his medical studies. Charles Lamb found these essays "delicious" and preferred them to Addison's. Taine found the essays "as easy and sensible as his poetry is contorted and unreasonable" and the late John Burroughs carried a copy of Cowley's essays about with him. "Solitude," he said, "seems to bring out their quality, as it does that in some people." They are indeed among the finest essays in the English language.

William Chamberlayne, born in 1619, was a contemporary of Cowley, who was born in 1618. Like Cowley, Chamberlayne also was an ardent Royalist

and during the civil war was one of the most active supporters of the Charleses. He wielded the sword as well as the lancet, as it appears from a passage in his *Pharonnida* that he took part in the second Battle of Newbury. When King Charles II was restored to the throne he wrote a long poem, *England's Jubilee*, in honor of the event. Robert Southey, the poet, said that Chamberlayne was "a poet to whom I am indebted for many hours of delight," but Chamberlayne is almost as obscure today as is Cowley. His chief work was his *Pharonnida*, an heroic poem in five books. "One of the most interesting stories that was ever told in verse," said Thomas Campbell, the Scottish poet and critic. This poem, full of stirring incident, later was made into a novel, under another title, and had a large sale. Although praising the plot of *Pharonnida*, Campbell added that "never was so much beautiful design in poetry marred by infelicity of expression and style that is at once slovenly and quaint." Henry Neele also called *Pharonnida* "a very noble work" and Edmund Gosse points out the close resemblance, in metrical form, of this poem and Keats's *Endymion* and is inclined to regard "the debt owed by Keats to Chamberlayne as larger than has generally been recognized." Chamberlayne's chief work other than *Pharonnida* was *Love's Victory*, a Tragicomedy. Chamberlayne spent practically all of his life as a physician at Shaftesbury, in Dorsetshire, where he died in January, 1689.

GERMAN DOCTORS CHANGE THEIR MINDS

One result of the prevailing degeneration in Central Europe which even the worst enemy of Germany probably did not foresee is the change in attitude of the medical men toward socialization, according to a dispatch from the Berlin correspondent of the Federated Press, dated May 10. This observer states that physicians who before the war were bitter foes of any attempt to socialize medicine have gone over to the ranks of the converts, and that the once obscure little Society of Socialist Physicians is now voicing the thoughts of a great number of medical men.

The basis for this change, if the correspondent reports correctly, is grim economic necessity. With the increased cost of living in Germany and the consequent impoverishment of the people, the situation of the doctors grew rapidly worse. The head of the family, if ailing, still came to the physician of the *krankenkasse* or sick benefit society, but the members of his family stayed away and tried to cure

themselves. As a result, the situation of medical men likewise grew desperate.

"There is the keenest of competition for the 'job'—this is all that it now amounts to—of curing an ailing person, and a consequent demoralization of the medical profession," writes the correspondent. "Quackery is encouraged, for a physician who might otherwise have sent a patient to some colleague who is a specialist on the particular disease in question will now, for economic reasons, hang on to the victim and try to effect a cure."

There is little hope of wealth and glory just now for the German medical man who distinguishes himself, and while the doctors of the *krankenkasse* secure a precarious living, the situation of the others is even more precarious. They are, of course, only sharing in the great nightmare which has fallen upon the professional classes everywhere in the war ridden countries, but their change of heart is significant.

WOMEN AS CAR CONDUCTORS

When the National War Labor Board, after the war, ordered the women discharged from trains, there was a great outcry from the National Woman's Trades Union League, and it was the same in England. No one wants to detract from the splendid service they rendered, nor to deny that it might wisely have been continued if babies—or rather, some satisfactory substitute for them—had been invented, but not the wisest obstetrician could think of anything save the old fashioned baby travelling the same route into the world and demanding prenatal care, and equally postnatal fostering. Any girl might become pregnant. There was continuous standing, and, in England, mounting outside steps, she was only partly sheltered from the rain; the safety of the riding public depended largely on her in rush hours; she had to exercise continuous self control and, instead of a low growled "damn," would answer back to any irritating passenger. There were late hours and seldom any Sunday rest. One or two days a month she would have been better at work under less nervous strain, but that item, of course, prevails everywhere, except that responsibility is here added. I have seen girls adding to the amusement of passengers by snapping at inoffensive people and storming at impertinent ones. "I'm doing what your mother neglected to do," said a red faced, angry conductor, as she smacked a cheeky boy's face, she herself being then liable for a summons for assault.

All this comes from Dr. Anna Howard Shaw's saying that the time has come when women have a right to ask that they shall be free to labor where labor is needed, and tested by their ability to render

service. "No human being can tell what another human being can do," she says. In the case of car work the doctors say that this special work is bad for prospective mothers with nervous dispositions, and a doctor cannot exactly be imagined as actuated by any personal desire to keep women out of any particular job. A girl, too, seldom eats properly; she is content with a "little something" in the form of coffee and sandwiches, eaten hurriedly, whereas a man sits stolidly down to a square meal, then has his pipe and forgets his car until he has to remember it.

LEGISLATION FOR WOMEN AND CHILDREN.

In spite of temporary setbacks, the realization that women as the mothers of the next generation require special protection in industry is being incorporated into law in an increasing number of states. The March issue of the *Monthly Labor Review* recounts a number of these instances. Recent legislation in New Jersey prohibits women from engaging in any industrial occupation for six weeks before and six weeks after childbirth; provides for an eight hour day and a forty-eight hour week in industries now covered by the ten hour law, and prohibits night work between the hours of ten p. m. and six a. m. Wyoming has passed an eight hour law for women except domestic servants. In South Dakota the mothers' pension law has been liberalized to include nursing, medical and hospital care for needy and expectant mothers. Pennsylvania has created a department of public welfare which will have supervision over mothers' pensions, work for dependent and delinquent children, prisons and prison labor, and other activities. Strengthening of the child labor law is recorded in Colorado, New Mexico, Vermont, and Wisconsin.

News Items.

Canada's Birthrate Is Double Mortality.—Canada's birthrate during the year 1920 was 27.47 in one thousand of population, as against a death rate of 13.31 in a thousand.

Jewish Memorial Hospital.—Plans have been completed for the Jewish Memorial Hospital to be erected at Dyckman Street overlooking the Hudson River. It will be dedicated to the memory of the Jewish soldiers, sailors and marines who died in the World War. The completed structure will cost about \$350,000.

Health Records Urged to Safeguard Marriage.—Dr. Max Hirsch, of Berlin, has suggested the establishment of a system of health registrations, to be carefully kept from childhood on, and available to marriage candidates upon mutual agreement. He states that this system would have a tendency to check social diseases and reduce undesirable marriage of the physically ill mated.

Dr. Addison Resigns from British Cabinet.—Dr. Christopher Addison, Minister without portfolio and formerly Minister of Health of England, has sent his resignation to Mr. Lloyd George. Dr. Addison resigned because the housing schemes, which the Government once supported with enthusiasm, had been abandoned.

Medical Societies to Hold Joint Meeting in Kansas City.—The plans for the fall meeting of the Medical Association of the Southwest have been combined with the annual meeting of the Medical Society of the Missouri Valley and the Medical Veterans of the World War. The meeting will be held in Kansas City on October 24th to 28th.

Sheppard-Towner Bill Passed by Senate.—The Sheppard-Towner bill providing for cooperation between the Federal and State Governments in protection of maternity and infancy was passed on July 22nd by the Senate and sent to the House. The bill carries initial appropriations of \$1,480,000 which the States would be required to match. It was passed by a vote of sixty-three to seven.

Doctor Telephones Radio Orders for Operation at Sea.—Dr. Raymond Barrett, of Brooklyn Hospital, recently telephoned instructions, which were wirelessly to sea, how to perform an operation with a herring knife on a man aboard a Standard Oil tanker two hundred miles away. The man had cut his finger with a piece of wire and an infection set in which required immediate treatment.

Death Rate Smallest in St. Paul.—The mortality statistics of the twenty principal cities for 1920 show that St. Paul, Minn., has the low death rate of 10.18 in a thousand and Portland, Ore., a close second, with 11.20 in a thousand. The New York city rate is 12.93, and Denver 17.47. Washington, D. C., had the highest death rate from typhoid fever, Cincinnati for measles, Rochester and Boston for scarlet fever, Buffalo and St. Louis for diphtheria and croup, Pittsburgh for influenza, Denver for tuberculosis, and San Francisco for cancer.

Infant Death Rate Lowest in the West.—The report of the American Child Hygiene Association for 1920 lists cities of over ten thousand population according to the number of infant deaths to a thousand of population. Seattle is first among cities of over 250,000 with fifty-six; Portland, Ore., second, with sixty, and San Francisco, third, with sixty-two. Among cities between 100,000 and 250,000, Houston, Tex., has the lowest infant death rate of thirty-seven; Spokane, Wash., comes next with seventy-one, and Oakland, Cal., with seventy-two.

Cholera in Soviet Republic.—Cholera is rapidly spreading in Russia, the disease being carried by starving refugees from the districts suffering from drought and famine. Over eight thousand cases have been reported in the Russian Republic, three hundred in the Ukraine, forty-eight in Simbrisk and nine hundred in Astrakhan. Cases to the number of 624 were discovered on railway trains in June. One of the chief causes of cholera along the Volga, where famine and disease are at their worst, is the migration of complete villages because of the lack of food.

Start Hartley Foundation.—At the first meeting of the Hartley Foundation, recently granted a special charter by the Legislature, Mrs. Helen Hartley Jenkins, the founder, was chosen president. The members of the executive committee include Dr. Samuel A. Brown, dean of Bellevue Hospital Medical College, and Dr. Thomas W. Salmon. The funds given by Mrs. Jenkins to the foundation, in memory of her father, amount to several million dollars. Special attention will be given to public health, mental hygiene and probation work.

National Health Council Issues Biweekly Reports on National Health Legislation.—Biweekly summaries of national legislation concerning public health have been issued by the National Health Council since last March, when Congress convened in special session. These summaries list and abstract all new health legislation and also report progress on bills previously outlined. The demand for them has been so great that arrangements have been made to distribute copies at twenty cents apiece. They can be secured by addressing the National Health Council, 411 Eighteenth Street, N. W., Washington, D. C.

Personal.—After thirty-one years' service, Dr. Charles P. Thwing, president of Western Reserve University, tendered his resignation on June 14th. He will devote his time to writing.

Dr. Alonzo E. Taylor has resigned from the staff of the University of Pennsylvania and will go to the University of California to conduct special research work on the subject of nutrition.

Dr. George M. Piersol, for thirty years professor of anatomy at the University of Pennsylvania, has resigned to devote his entire time to research work.

Dr. Charles H. Mayo, of Rochester, Minn., received the honorary degree of Doctor of Laws at the commencement exercises of Northeastern University on June 15th.

Dr. Hideyo Noguchi, of the Rockefeller Institute for Medical Research in New York, had conferred upon him the degree of Doctor of Science at the recent commencement exercises of Yale University.

Sir Robert Jones, of London, Dr. Carlos Chagas, of Brazil, and Dr. Herbert Charles Moffitt, received the degree of Master of Science at the commencement exercises of Harvard University held on June 23rd.

Dr. Alfred S. Burdick has been elected president of the Abbott Laboratories to fill the vacancy caused by the death of Dr. W. C. Abbott. Dr. Burdick has been closely associated with the Abbott Laboratories for over seven years.

Dr. and Mrs. David E. Hoag, of New York, sailed for Europe on July 21st. After an extensive tour they will return to New York in November.

Dr. Henry W. Frauenthal, medical director of the Hospital for Joint Diseases, New York, sailed on July 27th to visit the various modern hospitals in England, France and Italy.

Dr. L. Duncan Bulkley, of New York, has retired from the active practice of dermatology, to devote his attention to consultation practice and to the treatment of cancer. He has turned over his dermatological practice to his former associate, Dr. A. Schuyler Clark.

Postgraduate Medical School in Vienna.—The dean of the Vienna Medical Faculty has announced that the facilities for study are now the same as before 1914. The professors, doctors and assistants are ready to resume the teaching of graduate physicians in the same manner as before. The total number of beds in the Allgemeines Krankenhaus in Vienna available for teaching purposes amount to thirteen hundred. The opportunity for observing postmortem work is also the same as formerly, the number of autopsies being about three thousand annually. The official lectures and courses are delivered in German but special arrangements can be made for private English courses. Further information may be had by addressing the editor of the *Wiener medizinische Wochenschrift*, Vienna, IX., Borsellangasse 22.

Died.

ARRINGTON.—In Murrayville, Georgia, on Saturday, July 2nd, Dr. John D. Arrington, aged thirty-nine years.

BAER.—In Pittsburgh, Pa., on Sunday, July 10th, Dr. George Franklin Baer, aged thirty-seven years.

BEARDSLEE.—In Rye, N. Y., on Friday, July 8th, Dr. Frederick M. Beardslee, of Manchester, N. H., aged forty-six years.

BEEBEE.—In Buffalo, N. Y., on Friday, July 15th, Edwin L. Beebee, aged fifty years.

BURRITT.—In Washington, D. C., on Wednesday, July 6th, Dr. Alice Burritt, aged sixty-seven years.

CORNELL.—In Wappingers Falls, N. Y., on Saturday, July 16th, Dr. Isaac Martense Cornell, aged seventy years.

COX.—In Sandy Creek, N. Y., on Sunday, July 17th, Dr. William H. Cox, aged eighty-two years.

DRAKE.—In Detroit, Mich., on Tuesday, July 5th, Dr. Harlow B. Drake, aged seventy-two years.

DAVIDSON.—In Parkersburg, W. Va., on Wednesday, July 13th, Dr. William Johnson Davidson, aged fifty-four years.

D'AVIGNON.—In AuSable Forks, New York, on Saturday, July 9th, Dr. Francis J. D'Avignon, aged seventy years.

DAVIS.—In Patchogue, L. I., on Friday, July 15th, Dr. Milton Burr Davis, aged thirty-eight years.

ELLIOTT.—In Highlands, N. C., on Sunday, June 26th, Dr. John B. Elliott, aged seventy-nine years.

ERHARD.—In Syracuse, N. Y., on Thursday, July 7th, Dr. Philip Erhard, aged forty-four years.

FEHR.—In Allentown, Pa., on Saturday, July 16th, Dr. Howard A. Fehr, aged fifty-one years.

GALLIVAN.—In Boston, Mass., on Wednesday, July 13th, Dr. William J. Gallivan, aged fifty-six years.

HERMAN.—In Long Branch, N. J., on Tuesday, July 12th, Dr. Henry Herman, of New York, aged sixty years.

HIXSON.—In Cambridge, Ohio, on Friday, July 8th, Dr. George W. Hixson, aged forty-nine years.

JANSING.—In Cushing, Okla., on Sunday, July 10th, Dr. Joseph Henry Jansing, aged thirty-seven years.

MIDDLEDITCH.—In Barneveld, N. Y., on Monday, July 11th, Dr. James Middleditch, aged sixty-six years.

MORRISON.—In Los Angeles, Cal., on Sunday, July 3rd, Dr. Norman H. Morrison, aged sixty-eight years.

ROBARDS.—In Columbus, Ind., on Thursday, July 7th, Dr. Richard B. Robards, of Harrodsburg, Kentucky, aged forty-five years.

ROSS.—In Grand Rapids, Mich., on Thursday, July 14th, Dr. William H. Ross, aged seventy-six years.

SILER.—In Mercer, Tenn., on Monday, July 4th, Dr. Manly J. Siler.

SMILEY.—In Philadelphia, Pa., on Tuesday, July 19th, Dr. Edwin R. Smiley.

STATON.—In Tarboro, N. C., on Friday, July 1st, Dr. Lycurgus Lafayette Staton, aged seventy-one years.

TALBOT.—In Raquette Lake, N. Y., on Saturday, July 16th, Dr. Robert Bancker Talbot, of New York, aged sixty-eight years.

WEEDON.—In Eufaula, Ala., on Saturday, July 2nd, Dr. Walter R. Weedon, aged forty-eight years.

LONDON LETTER.

(From our own correspondent.)

LONDON, June 4, 1921.

Smokeless Fuel—The State and Housing—The Prevention and Treatment of Tuberculosis—Postgraduate Instruction in Glasgow.

A smokeless fuel is a desideratum from many points of view, not the least of which is that of health. In London this question is one of supreme concern, and that the subject of low temperature carbonization and smokeless fuel is arousing increased interest and attention was shown by the large audience which came to the Royal Society of Arts, London, on April 13, 1921, to hear Professor H. E. Armstrong discourse on the subject. The professor has long given prominence to his personal conviction as to the great possibilities of the newer method of carbonization as a means to the more efficient utilization of coal, with the recovery of important byproducts and a step toward the reduction of atmospheric pollution. Professor Armstrong referred to the natural store of products, chemical and power, in the form of coal, the great asset and salvation of this country's progress.

Reviewing the history of the methods of direct consumption and indirect treatment, he emphasized the appalling waste which had resulted, waste now proverbial. Coming down to modern times, the work done by Parker and Jones was sketched, and some indication of the scale of operations at Baraugh given. The methods of low temperature carbonization have for some time been under critical review. Totally diverse opinions and convictions are forthcoming as to the efficacy of the several processes. These depend to some extent upon the point of view. As a source of heat and power, the gas engineer may want to adopt a British Thermal Units basis of adjudicating the results. From the point of view of oil production in times of emergency and shortage, the tar distillates would increase in importance. From the domestic and health points of view, a sufficiently compact, easily burnable product is the chief desideratum. The economic adaptation of low temperature carbonization processes is a matter upon which a full and frank discussion would doubtless be welcomed in many quarters.

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Sir Alfred Mond, who has been appointed Minister of Health in the place of Dr. Addison, made an important announcement as to the future policy of the Government in regard to housing to a deputation from the Association of Municipal Corporations. Sir Alfred dealt with the question of commitments into which local authorities have entered, and said that, in view of falling prices in material and labor, every effort must be made to obtain modifications of the contracts already let. The general housing subsidy extends only to July next year, and "it is not impossible," the Minister observed, "that the Government may be ready to enter into another scheme, should it be necessary." The National House and Town Planning Council, in the course of a statement, said that the fall which has recently taken place in the cost of cottage building is warmly welcomed by the housing committees of local author-

ities as removing yet another of the difficulties which have delayed the fulfillment of a national duty. The decline in cost varies greatly from district to district. Compared with the tenders submitted in September, the reduction is in some areas equal to twenty per cent. This reduction in cost, it is stated, is in some measure due to the steady desire of employers and operatives alike to fulfill, in respect of housing, their duty to the rest of the community.

It may be said that the erection of houses has been the great stumbling block in the way of carrying out the schemes of the Ministry of Health. This was the first and most important plank of their platform. It has been long conceded that the bad and indifferent housing accommodation of the masses of Great Britain, especially perhaps in the cities, although it is woefully inadequate in the rural districts, was chiefly responsible for the prevalence of ill health and lack of development in all parts of the country. The slogan of the Ministry is prevention of disease, but how can disease be successfully prevented while domestic hygiene is as it is? Obviously, then, the first and most essential step in the direction of prevention was to provide a sufficient number of hygienic houses.

Dr. Addison and his colleagues fully grasped this fact, and proceeded with plans to remedy the deficiency. But they do not seem to have quite understood the state of affairs that confronted them. They sketched an ambitious plan for building houses on a wide scale. So far so good, but they had not counted the cost. It was found that to build houses conceived on a modest plan would cost so much that workingmen could not afford to pay the rent, and that the greater part of the burden must fall on the ratepayers. The ratepayers, taxed already almost past endurance, strongly objected, and so the projected housebuilding has been extremely slow. It is to be hoped that a satisfactory housing scheme will be ultimately carried into effect.

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The prevention and treatment of tuberculosis is a subject of perennial interest, not only because of its manifest importance but also because of the diverse views which exist regarding the disease. There are still many unsolved problems with regard to tuberculosis, and if advance is to be made in prevention and treatment these problems must be earnestly grappled with and some of the obscure features elucidated. In many parts of England there has been an increase of tuberculosis during the past few years, and this has been the case in other parts of the world.

Dr. Sidney Barwise, in his annual report for 1919 as medical officer of health for the County of Derby, provides some interesting facts and makes some pertinent remarks on tuberculosis. It is pointed out that only a few years ago the generally accepted view was that phthisis was due to inhalation of tubercle bacilli in dust from dried sputum, and that over fifty per cent. of glandular and abdominal tuberculosis was due to the consumption of milk containing the bovine type of tubercle bacillus. Investigations on the portals of entry into the body of the specific microorganism have modified our

views on this point. A leading authority, I. M. Pottenger, has recently described tuberculosis as primarily a disease of the lymphatic system, and there is a considerable amount of evidence in favor of the view that the tubercle bacillus gains access to the body through the tonsils or intestine. The droplets sent out in coughing by a person in certain stages of the disease are probably one of the chief sources of infection. Walsham, in 1903, called attention to the tonsil and the cervical glands as a common channel of entry. Beatty and Carnegie Dickson believe that the most frequent mode of entry in the human subject, except in the case of young children, is by way of the tonsils, and perhaps in some cases by way of the teeth. The bacilli pass to the cervical glands and into the lungs by way of the peribronchial lymphatics. From the root of the lung the path of infection may be outward and upward, involving the apex of the upper lobe, or it may spread fanwise and involve the pleura. There is now fairly general agreement with Sanarelli's view that man only survives by having acquired immunity as a result of a mild attack in early life. Support is, of course, given to this view by the large proportion of bodies showing either active or healed manifestations of the disease at postmortem examinations made upon persons who have died from other causes.

Among the practical suggestions made by Dr. Barwise to prevent the spread of tuberculosis are better ventilation in houses, better facilities for washing, and better places for storage of food. The efforts of health visitors should be concentrated on preventing infection during the first few years of life. The child should not be allowed to crawl on the kitchen hearth rug, but have a clean, washable crawling rug, and its hands and face must be washed before each meal. If infected during the first year of life, the result is almost always fatal, and children should be removed from tuberculous mothers, as Bang, of Copenhagen, removed the calves from tuberculous cows. Moreover, the campaign against tuberculosis in cattle must be continued, and until milk is available from certified tubercle free cows that given to infants under two years of age must be sterilized. It must be remembered, however, that the child has to acquire immunity. It cannot always be kept wrapped in cotton wool. Dr. Barwise, therefore, thinks that after it has reached the age of two years it should take its risk in acquiring immunity through a localized tuberculosis by allowing it occasional small doses of the ordinary milk of commerce.

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According to the correspondents of the *Lancet*, April 2, 1921, in Scotland, for many years postgraduate instruction in medicine has been given in several Glasgow hospitals, but only in the early part of 1914 was a special endeavor made to organize a permanent, comprehensive postgraduate teaching scheme for Glasgow as a whole. The outbreak of war delayed further progress until 1919, when an emergency postgraduate course was organized and carried on in the summer and autumn. The course was highly successful, and the committee in charge felt justified in recommending the institution of a

permanent scheme. A scheme of this kind was adopted on March 2, 1920, at a joint meeting of the Faculty of Medicine of the University of Glasgow, and the General Committee for Postgraduate Medical Teaching, which had been appointed in 1914. The various teaching institutions and teachers taking part in the scheme constitute an association the business of which is managed by a board elected periodically by them. The chairman of the board is Sir Donald MacAlister, and the vice-chairman Sir Hector C. Cameron. To inaugurate the scheme, the board arranged a series of weekly demonstrations for practitioners, extending from November, 1920, up to May of this year, and the number of practitioners taking advantage of the series is said to be satisfactory. For the ensuing summer and autumn the board has arranged a comprehensive course of instruction for medical practitioners extending from May to October. Most of the Glasgow hospitals are taking part in the scheme, which has been arranged as far as possible so that a practitioner who so desires may occupy the greater part of each day attending classes open to all qualified medical men and conducted independently of the undergraduate courses. A practitioner may enroll for one or several classes, and may attend for one or more months, at his discretion. The board has also had in view the provision of facilities for young graduates and others who may wish to obtain a closer acquaintance with hospital work in one or other of its branches, and who are prepared to give the necessary time. Arrangements have been made whereby a limited number may become attached to wards or outpatient departments nominally as clinical assistants, for definite periods throughout the year. As such they would work under the direct supervision of the physician or surgeon in charge and carry out such detailed investigations as directed. A young graduate wishing to specialize in children's diseases, mental diseases, tuberculosis, venereal diseases, or other subjects, should find such training invaluable. It has long been felt that Glasgow, in the midst of a vast industrial population, should become one of the leading centres of postgraduate medical teaching.

The question of postgraduate medical teaching is arousing a good deal of interest now among members of the medical profession here, although not so great interest as the obvious importance of the subject would seem to demand. As has been pointed out several times in this letter, London is an ideal centre for postgraduate teaching, certainly in wealth of material equalled by no European city and surpassed only possibly by New York. Of course, the situation of London as a medical centre is greatly superior to that of New York. However, a great deal of organization is required before London can compete with Berlin and Vienna, at least as these cities were before the war. It is likely, too, that if the schemes formulated to make of London the Mecca of postgraduate medical students, especially of American postgraduate students, fail, that Berlin and even Vienna may regain their pride of place. It is encouraging to learn that the Glasgow medical profession is taking time by the forelock in this direction.

Book Reviews

HIPPOCRATES.

The Genuine Works of Hippocrates. Translated from the Greek with a Preliminary Discourse and Annotations. By FRANCIS ADAMS, LL. D., Surgeon. Two Volumes in One. New York: William Wood & Co., 1921. Pp. v-366.

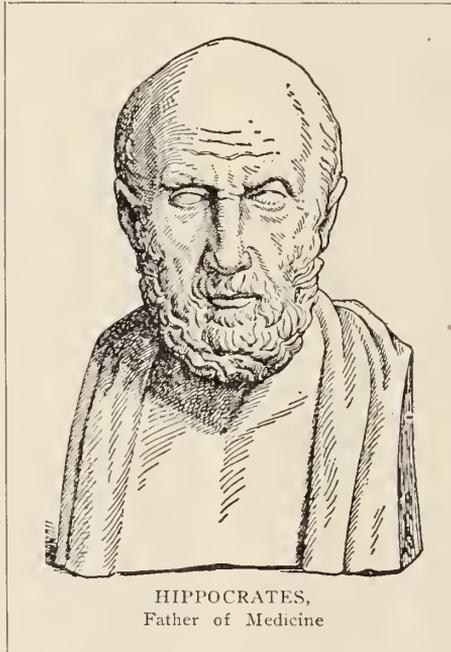
In this edition of the translation of the seven books of Paulus Ægineta, Dr. Adams in 1844 says he is sensible of the growing conviction in the profession of the value of ancient authorities. He has been in his grave sixty years and we again entertain the same conviction after an interval almost as long during which the medical profession has not had that conviction at all. In the days of Adams's bright hopes Sprengel's history, the best by far ever written, had passed into the French edition. Kühn, a living monument of industry and erudition, was but recently dead, Daremberg was beginning his career, Ermerins, Coray, Grimm, Greenhill, Littré above all, were marking the epoch by historical research in medicine and Adams's hopes had full justification, though they had no realization. With the death of Adams (1861) that epoch had all but closed and Daremberg, living eleven years longer, left much work unfinished and still more, apparently, unpublished in the débâcle of 1871, and when France arose again professional interest in that branch of medical knowledge was practically extinct. "Know thyself" is the first apothegm the wisdom of age ladles out to youth. How the medical profession is going to know itself without knowledge of its birth, adolescence and vigorous manhood surpasseth understanding indeed. What are we? Whither are we going?—The problem for the philosopher and the problem for the prophet—it is quite futile to consider until we have some idea whence we come.

We are now entering upon a revival of interest in the history of medicine, borne on the crest of a wave of angry protest against the long raging abuse and insults which men of science, for at least a generation, have heaped upon the cultivation of the humanities. The folly of discarding the granary which has fed human thought for two thousand years, because the harvest was abundant in the fields around it, is now only too apparent. This harvest, it is true, had already swelled to portentous proportions thirty years ago, but even then the evils of a narrow specialism had begun to be fully manifest. I doubt if for many years we can hope for a renaissance of that fruitful interest in the history of medicine which preceded the rise of modern path-

ology, of synthetic chemistry, of bacteriology, but at least let us beware of the silliness of imagining that these *et alia similia* are the only fields worthy of culture by medical man.

If then we are to find in the pulsations of world thought an explanation of why we have not seen a second edition of Adams's *Hippocrates* in a period of more than seventy years since its first issue under the ægis of the Sydenham Society, we must realize we are up against a sort of cosmic law. This, if true, also is ample to explain why no other author has given us another and a better rendition of the works of the great Hippocrates. But perhaps it is not true, perhaps it is because men's minds were so widely diverted to, so powerfully attracted by the great discoveries made possible by the inventions of

physical science, by the microscope and a hundred other scopes and meters, that they were drawn away from the ancient sources which still exist. Adams's translation of *Hippocrates*, the only one so comprehensive in the English language, still exists for us and though in America we have it only in this bulky, fragile, one volume form of reprint, the profession owes its sincere thanks to the publishers for making it accessible to us in any form. It cannot compare in scholarship with Littré's great work. No translation unaccompanied by the text lends itself to serious critical study. *The Preliminary Discourse* is of historical value, but this also suffers from the absence of the Greek text. Nor has Adams's edition the value of his treatment of the Paulus



Ægineta. The commentaries to that, including extensive though not always exact and specific references to all Græco-Roman and Arabian writers, dealing with the same points, are invaluable to the student and all but unique. By this alone he could claim rivalry in service to medical history with the great, if not encyclopedist, the encyclopedic Frenchman. In his edition of *Arctæus* Adams showed he too could edit a Greek text and it was a serious oversight, either on his part or on the part of the Sydenham Society, that the text he used does not accompany his translation. In its absence there is little use in speaking of its fidelity of rendition despite his protest that he paid more attention to faithfulness in this than to elegance in diction. Certainly no reader will accuse him of the latter, but he occasionally will have reason to complain of his obscurity and to suspect that at times he adds his own incoherence to that of an ancient manuscript.

Litré's work is open to no such uncharitable conjectures.

The question of the authenticity of the Hippocratic books has always been a baffling one, but in its pursuit so much is elicited of an historical and literary nature that it is, incidentally and in itself, interesting and instructive and such it will probably always remain. It can only be touched upon here and an enumeration of all its canons even is impossible. Adams urges that if we are to be at all influenced in our judgment of the genuineness of the various books of the Hippocratic Corpus by their style and contents, we must first establish in our minds which ones we are to regard as the style and opinion of Hippocrates as standards by which to judge the others. We have no resource for this but authority and we have no authority ancient enough to make it impressive. Erotian and Galen lived, one about five hundred and the other about six hundred years after the birth of Hippocrates, probably a little longer afterwards if anything. The former gives no reason for the books he selects as genuine and Galen gropes in much the same way as we do. So this canon of criticism, this basis of comparison upon which, in our hero worship, we are prone to lay the most stress we perceive to be an exceedingly shaky one. Such being the state of the matter a critic of much later times feels himself quite at liberty to differ with Galen as to what is worthy of Hippocrates and what is not and in his opinion he is likely, if this is the only rule he goes by, to be largely prejudiced, at least as to the real doctrines of Hippocrates, by the prevailing fads of his own epoch. From this Adams, despite the exceptional clearness with which he defines this aspect of Hippocratic criticism, largely suffers and even Litré does not escape its influence. Nevertheless it is not always fallacious. For instance, all agree that *The Aphorisms* is a genuine book, but to assert that a very large minority of the aphorisms are from the hand of the Father of Medicine is to brand him as a blathering idiot. A few of them inevitably arouse contempt whatever the stage of our medical evolution may be.

The etymological, idiomatic, linguistic guides to criticisms of authenticity are excluded in the face of a translation without a text. In Adams's day archeology hardly at all controlled the historical data, and here is an opportunity for the modern critic to find a new point of view from which to review the matter, but in this field of Hippocratic interest as well as in others the modern commentator has an especial advantage in the possession of a hoard of knowledge in regard to primitive man which practically was not existent at all until many years after Adams's death.

He and Litré being contemporaries one need not be surprised to find *The Genuine Works of Hippocrates* correspond very closely indeed with the works which are regarded as genuine by the great French savant, but Grimm's list amounted to only five. The list of Litré runs to thirteen and Adams looks with favor on seventeen as being authentic, but he is in doubt as to five or six he has included, while Litré thinks perhaps he has excluded too many. Adams is not at all satisfied with the genu-

ineness of *Ancient Medicine* and Litré is quite sure *The Sacred Disease* is not from the hand of the Master. The former book is surely of the very highest rank among the works of Greek genius and the latter is plainly worthy of the hand of the Father of Medicine. So it must be acknowledged that the sort of Hippocratic criticism I have singled out for mention is not always open to the objection of the bias of the critic.

The plainly spurious books which are found in the Litré edition but are excluded by Adams's title, a little presumptive one may be permitted to think, in themselves throw much light not on Greek medicine alone, but on this very question of authenticity. Some of them are quite evidently the products of a later generation than that of Hippocrates II, one or two are probably largely anterior to it in origin, some are the work of ignorant and superstitious men, some probably not of medical men at all, but, genuine or spurious, they all form a Corpus of absorbing interest to the student of the progress of human thought and a collection of writings which are scarcely less so to the broad minded student of medicine.

LAW AND PSYCHIATRY.

Das Eherecht der Geisteskranken und Nervösen. By Prof. Dr. A. H. HÜBNER, Oberarzt für Klinik. Bonn: A. Marcus und E. Weber's Verlag, Dr. Jur. Albert Ahn, 1921. Pp. 87.

This little book has its value to psychiatrist or jurist as a comparative study of conditions which pertain in this as well as in the author's country. It is a stimulus to the mutual interest of psychiatrist and jurist in testing the laws regarding marriage as to their accordance with the actual conditions which they presume to regulate or to remedy. It is a commonplace of knowledge that such laws everywhere fall short of such aim. Hübner has here in a somewhat more definite way pointed out the actual discrepancies between theory and fact. In doing so he shows that the sciences of psychiatry and jurisprudence have not been idle during the twenty years of the existence of the present laws in Germany in improving interpretation and application of such laws. He shows the difficulties which lie in the way of exactness of diagnosis of personal condition, of the mental disease or other matters and how therefore at best general laws are either too sweeping or too restricted to cover individual situations. So much the more then is there necessity for broad and just psychological and as well as psychopathological consideration of each case and of the reform of the whole body of laws. He reminds his readers of the sense of justice which actuates the mass of people and which makes objectionable the subterfuges that have to be resorted to under imperfectly fitting laws. These same people are at the same time so driven by economic needs and by life hunger that they must take up with even imperfect aid. One could wish that Hübner had enlarged upon the psychological and psychiatric aspects of the situations in many cases and made a fuller treatise of the subject. He has given fruitful suggestions, however, for the furthering of his avowed purpose, to aid in the preparation of more scientific foundations for the law of the future.

SQUINT.

Squint. Its Causes, Pathology, and Treatment. By CLAUD WORTH, F. R. C. S., Consulting Surgeon to the Royal London Ophthalmic Hospital (Moorfields); Consulting Ophthalmic Surgeon to Queen Mary's Hospital for the East End. Fifth Edition. Philadelphia: P. Blakiston's Son & Co., 1921. Pp. ix-242.

Five editions within the space of some seventeen years is indeed an enviable record that any medical author may be proud of, the more so as the work is on a narrow special subject that appeals to a limited circle of readers. A medical best seller must possess peculiar qualities to have obtained such a success; and foremost among these we consider the clarity of style and simplicity of exposition, combined with an absence of dogmatic or supposititious reasoning that cloud and obscure many a thesis. Thus the book is made very readable and easily accessible to the general practitioner, we are almost tempted to say to the average intelligent layman. At the same time the specialist will find many an interesting page that he may peruse most profitably.

We were especially impressed by Chapter X on Treatment of Squint, with illustrative cases, an array of clinical cases of particular interest and instruction as their histories are gone into most minutely and conscientiously, extending over a period of years, thus enabling the reader to follow up and participate, as it were, together with the author in the treatment of the cases, and analyze the results. The authoritativeness of the author's conclusions, whether one agrees with him or not, may be gauged by the fact that he had kept detailed notes of every case of squint which came under his observation since 1893, and his experience was thus drawn from an enormous mass of material, both clinical and from private practice. For the last twenty years he was gradually weaned from doing simple tenotomies, or shortening of the muscles, or advancement with tenotomy of the opposing muscle, until he began doing exclusively simple advancements, an operation, as he thinks, which admits of accurate adjustment, and gives permanent results.

A MANUAL ON DISEASES OF THE NOSE AND THROAT.

A Guide to Diseases of the Nose and Throat, and Their Treatment. By CHARLES A. PARKER, F. R. C. S. (Edin.), Consulting Surgeon to the Throat Hospital, Golden Square, W., and LIONEL COLLEDGE, M. B., F. R. C. S., Surgeon to the Ear and Throat Department, St. George's Hospital, S. W., and to the Throat Hospital, Golden Square, W. Second Edition. London. Edwin Arnold, 1921. Pp. xv-583.

Many portions of this useful guide have been rewritten and much new matter has been added, owing to the delay in preparing the edition, caused by the war. In its present form Parker and Colledge give us an excellent manual for the instruction of the postgraduate student as well as a convenient reference handbook for the practitioner. The most instructive and practical section of the entire volume is the introductory one, dealing with methods of examination of the upper respiratory tract, the various procedures of local treatment, with numerous formulae; and the general principles and technic of internal and external operations, and of diathermy.

MERRICK.

A Chair on the Boulevard. By LEONARD MERRICK. With an Introduction by A. NEIL LYONS. New York: E. P. Dutton & Co., 1921. Pp. xiii-390.

A collection of stories with great charm. They show a bit of O. Henry, of Balzac, of De Maupassant, and yet have an individuality all their own. The boulevard and the twisting stairway of the Paris Latin Quarter are brought to the reader without the ponderousness of detailed description. Each story in the book may be depended upon to furnish an enjoyable *quart d'heure*.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

ADDRESSES ON PSYCHOANALYSIS. By J. J. PUTNAM, M. D., Emeritus Professor of Neurology, Harvard University. With a Preface by SIGMUND FREUD, M. D., LL. D. International Psychoanalytical Library, No. 1. London, Vienna and New York: The International Psycho-Analytical Press, 1921. Pp. 470.

PSYCHOANALYSIS AND THE WAR NEUROSES. By Dr. S. FERENCZI (Budapest), Dr. KARL ABRAHAM (Berlin), Dr. ERNST SIMMEL (Berlin), and Dr. ERNEST JONES (London). Introduction by Prof. SIGMUND FREUD (Vienna). The International Psychoanalytical Library, No. 2. London, Vienna and New York: The International Psycho-Analytical Press, 1921. Pp. 59.

GENERAL PATHOLOGY. An Introduction to the Study of Medicine, being a Discussion of the Development and Nature of Processes of Disease. By HORST OERTEL, Strathcona Professor of Pathology and Director of the Pathological Museum and Laboratories of McGill University and of the Royal Victoria Hospital, Montreal, Canada. New York: Paul B. Hoeber, 1921. Pp. xxi-357.

DIABETES MELLITUS. A System of Diets. Diet Table I: Starch Free Diet, Qualitative List; Diet Table II: Minimal Fat, Starch Free, Measured Diet; Diet Table III: Minimal Fat, Starch Free, Weighed Diet; Diet Table IV: Low Fat, Starch Free, Measured Diet; Diet Table V: Low Fat, Starch Free, Weighed Diet; Diet Table VI: Accessory Diet, Rich in Carbohydrates. By HERMAN O. MOSENTHAL, M. D., Assistant Professor of Medicine and Attending Physician, New York Post-Graduate Hospital and Medical School. New York: Paul B. Hoeber, 1921.

THE ASSESSMENT OF PHYSICAL FITNESS BY CORRELATION OF VITAL CAPACITY AND CERTAIN MEASUREMENTS OF THE BODY. By GEORGES DREYER, C. B. E., M. A., M. D., Fellow of Lincoln College, Professor of Pathology in the University of Oxford; Corresponding Member of the Royal Danish Academy of Letters and Sciences. In Collaboration with GEORGE FULFORD HANSON, Late Lieutenant U. S. A. Medical Corps, Air Service. With a Foreword by CHARLES H. MAYO, M. D., Rochester, Minn. New York: Paul B. Hoeber, 1921. Pp. xiv-127.

ANXIETY HYSTERIA. MODERN VIEWS ON SOME NEUROSES. By C. H. L. RIXON, M. D., M. R. C. S. Senior Neurologist, Ministry of Pensions' Neurological Hospital, Exeter, Late House Physician, Casualty Officer, and Resident Anesthetist, St. Thomas's Hospital; Captain, R. A. M. C.; Officer in Charge of Neurological Section, Reading War Hospital, and D. MATTHEW, M. C., M. B., Ch. B., Neurologist, Ministry of Pensions' Neurological Hospital, Exeter; Late House Physician, and House Surgeon, Dundee Royal Infirmary; Captain, R. A. M. C. With a Foreword by Colonel Sir A. LESLIE WEBB, K. B. E., C. B., C. M. G., etc., Director General of Medical Services, Ministry of Pensions. New York: Paul B. Hoeber, 1921. Pp. xi-124.

Practical Therapeutics

TREATMENT OF ACUTE ALIMENTARY DISTURBANCES OF INFANCY.

BY HARRY LOWENBURG, A. M., M. D.,

Philadelphia,

Pediatrist to the Mount Sinai and Jewish Hospitals.

The multiple classifications of the diarrheas of infancy, variously founded upon more or less insecure pathological, etiological, and clinical data, have provided a medley of therapeutic procedures according to the particular viewpoint adopted by their originators. Of far-reaching importance is the knowledge that rarely, except in the truly infectious types of the disease, which, except in epidemics, constitute the minor number of cases seen, do definite or lasting changes develop in the mucosa of the gut. This observation has been made in innumerable instances, to the amazement and discomfiture of painstaking observers in cases when death resulted from severe alimentary disturbances for which no explanation seemed available. Thus have become obsolete the terms gastritis, gastroenteritis, enterocolitis, and similar expressions, in so far as each respectively is intended to represent definite organic change in a particular section of the gastrointestinal mucosa and a definite symptom complex as characteristic of that section supposed to be involved. Pathology alone therefore cannot provide us with a proper index for treatment. It will be seen that the trouble lies not so much in the intestinal wall as in the intestinal contents. Clinical data likewise, i. e., a classification based upon symptoms alone, will not provide a definite basis for treatment.

Viewed etiologically, however, the situation may be more intelligently approached. Certain types of bacteria, supposedly having invaded the intestinal mucosa, were held responsible for the various forms of the condition as represented by more or less severe vomiting, the different types of diarrhea, and systemic toxemia. However, this can be true of but a limited number of cases, the infectious type already referred to, notably the Shiga bacillus variety of dysentery. The principal food elements, protein, carbohydrate and fat, producing so-called food injuries and resulting in protein intolerance, carbohydrate intolerance, fat intolerance, as represented by supposedly definite gastrointestinal symptoms ascribable to each respectively, cannot alone explain or form a basis for definite treatment. Nor can the effect of high temperature, either through its action upon the principal food, milk, or by reason of its depressing effects upon the individual, as many of these cases occur during cool weather. A combination of these elements, however, especially the first two, bacteria and food, provides the most rational explanation and points the way to treatment.

Bacteria require pabulum for their growth and development. Food provides that pabulum and the type of food will determine the preponderating type of bacteria in the intestinal flora. The disintegration of certain foods, notably fat and sugar, pro-

duce an acid medium in which only acid producing organisms will thrive. These organisms, together with certain enzymotic agents, further assist in the digestion or disintegration of these food elements. When within the limits of tolerance, this action is normal and a state of intestinal neutrality or of mild alkalinity is maintained by the digestion and disintegration of protein, which provides an alkaline medium in which many alkali producing organisms will thrive and which in turn assist, together with enzymotic agents, in the digestion of protein. Thus there exists a certain form of symbiotic activity between food and bacteria and this activity seems to be the responsible factor determining intestinal normality or abnormality. Fat and sugar determine intestinal acidity; protein determines intestinal alkalinity. A correct balance between the three means normality and it is readily conceivable how by means of proper food manipulation the actions of the bowels may be controlled. If either excessive acidity or excessive alkalinity persists over too long a time diarrhea and systemic disturbance will ensue as a result of irritation of the intestinal mucosa. The bowel runs exactly as the nose runs when the Schneiderian membrane is irritated by snuff, for instance. Thus it becomes clear that the exciting factor lies not within the intestinal wall but within the intestinal contents as previously stated and it seems logical to assume that by means of an intelligent application of diet we possess the most effective means, not only of preventing but of curing the acute alimentary disturbances. This is borne out clinically. However, one may not speak accurately of a protein disturbance, a fat disturbance, or a sugar disturbance, by reason of the mere presence of any excess of any particular food element in the stool. Anything that increases peristalsis to the point of causing diarrhea interferes with the digestion of all the food elements and hurries them through the intestinal canal. Hence, if sugar happens to cause the diarrhea there is no good reason to expect that the stools will not contain an excess of undigested protein and fat curds and oil globules. The same effect would result from mixing a purgative with the food and yet it would be manifestly wrong to regard the appearance of curds as confirmatory of the baneful effect of protein or the fat of the food as the case may be.

Diagnostically and therapeutically, therefore, more information is obtained from a study of the reaction of the stool than from its gross and microscopic appearance and from a careful history of the case, for after all the matter of food tolerance is a matter of individual resistance and is not determined by a fixed academic percentage of a particular ingredient. Excessive alkalinity would indicate that cure would be accomplished by the withdrawal of protein and the feeding of fat and sugar in tolerable amounts. Excessive acidity, by far the more common occurrence in diarrhea, indicates the withdrawal of fat and sugar from the diet and the feed-

ing of large amounts of protein in digestible form. Inasmuch, however, as anything which would cause diarrhea impairs the functional activity of the gut, the first requisite of treatment, irrespective of the causative factor, would be the withdrawal of all food in order to rest the bowel and thus increase its digestive functions, or, in other words, its tolerance for any food element.

TREATMENT.

As far as treatment goes, from the foregoing, therefore, diarrhea may conveniently be roughly classified as noninfections—that dependent on food and bacteria within the gut, and the infectious—that wherein the bacteria have invaded the intestinal wall and are responsible for inflammation and ulceration. In order to meet the indications of the more common variety or the noninfectious type—that dependent upon fat and sugar intolerance, Finkelstein has provided us with two fundamental procedures, a, hunger period of twenty-four to forty-eight hours and, b, the use of comminuted cow curd as represented by Eiweissmilch (albumin milk—protein milk), which is fat and sugar poor and protein rich and in which the protein exists in finely comminuted curds.

The question of purgation must be decided in each individual case. If the infant is toxic, as evidenced by extremely high temperature, then swift purgation is indicated. Calomel is too slow and should not be employed unless vomiting, which does not yield to a single lavage, is present, when the drug should be placed dry upon the tongue in doses one tenth to one twentieth of a grain for ten doses every ten to fifteen minutes. During this time no fluid or food is given by mouth. Half an hour after the last dose half an ounce of castor oil is administered. If vomiting is absent or yields to a single lavage, calomel is omitted and castor oil is administered immediately. The majority of infants, however, do well without initial purgation if the temperature is not high. Diarrhea for the first twenty-four hours may be regarded as a benign process, provided no food is given. The bowel simply empties itself of irritating material.

Whether purgation is employed or otherwise the next step in the management of these cases is probably the most important of all and must be strictly enforced. This consists of a hunger period to which reference has just been made and which should last from twenty-four to forty-eight hours, depending upon the severity of the symptoms; usually twenty-four hours is sufficient. During this time absolutely no food of any character is allowed. This cannot be too strongly impressed upon the person in charge of the case. Weak tea is administered freely. It is made in the usual way from ordinary tea leaves and is sweetened with one grain of saccharin to the quart. It may be administered cool or at room temperature. The infant may take as much of it as it will and its use is not contraindicated by vomiting should this be continued, after lavage or the calomel course. Even after feeding is started the tea may be administered between feedings simply as a drink. During the hunger period saccharated tea serves to provide fluid, which is all important in combating acidosis, and it is also

slightly astringent. During the tea feeding period or immediately following it and continued over a more or less indefinite period of the illness, i. e., until the stools become thick and constipated, the following is administered every three hours in teaspoonful doses:

Calcii carbonatis (cretæ preparati).....	5iv
Fuller's earth	5ii
Tr. kino	fl. 5iv
Oil anise	ʒiii
Aquæ des., q s. ad.....	fl. ʒiii
Saccharin	gr. 1/10

The purpose of the calcium carbonate is to hasten intestinal alkalinity. The fuller's earth is a thickening, alkalizing and astringent agent. Kino is a powerful astringent. Oil of anise is carminative and of pleasant flavor and the saccharin sweetens. This combination has proved eminently satisfactory and is a decided improvement upon the old chalk mixture since the latter is too rich in sugar, which at this stage of the treatment should be withheld.

Aside from this no other medication is employed unless clearly indicated, and this rarely happens in the noninfectious type of diarrhea. Excessive peristalsis and restlessness may be controlled by small hypodermic injections of morphine sulphate (one eightieth to one twentieth of a grain), repeated if needed at six hour intervals. I have also experienced excellent quieting and anticolicky effect from small doses (one sixteenth to one half of a grain) of luminal. Where there have been repeated relapses, the result of mismanagement, and the infant appears dehydrated, the intraperitoneal injection of normal saline or the same given by hypodermoclysis or intravenously by fontanelle (longitudinal sinus route) or a five per cent. solution of sterile glucose solution—one sixtieth of the body weight, are all useful lifesaving measures, as is also hydrotherapy (bathing) in general.

Irrigations.—These need not be employed unless blood is present in the stool, when once or twice daily a pint or more of one half of one per cent. solution of tannic acid, temperature 100° F., may be allowed to run in and out of the bowel. It seems to have an excellent effect in causing the blood to disappear.

Hydrotherapy.—High temperature and restlessness, if not controlled by the hunger period and purgation, are best influenced by the gradually cooled bath. The temperature is started at 100° F. and gradually cooled to 80° F. while the patient remains immersed. The effect is usually prompt and persists over a period of three to four hours, when it may be advantageously repeated if necessary. This measure failing to control restlessness, however, recourse may be had to morphine or luminal, as just stated.

Feeding.—This logically follows the preliminary treatment by starvation and tea. If we believe that the majority of these cases of diarrhea depend upon fermentation of fat and sugar, which serve as pabula for the acid producing bacteria, as evidenced by the reaction of the stools to litmus paper, then these substances must be eliminated from the diet for no antiseptic possesses the power to destroy or change the intestinal bacterial flora as well as the food pabulum in which these bacteria find them-

selves. They will disappear if their source of life is destroyed or withheld. This is the correct philosophy which underlies a correct conception of the dietetic treatment of these cases. Hence we must provide aliment upon which only alkalinizing microorganisms will thrive. The end products of the enzymotic and bacterial digestion of this agent must tend to produce intestinal alkalinity or at least intestinal neutrality. Such a substance is protein.

Ordinary cow curd, however, is thick and tough and indigestible to a high degree. This may be influenced favorably by boiling, predigestion, cereal decoctions, dilution, citrate of soda or best by mechanical comminution, as found in buttermilk or the albumin milk of Finkelstein. The latter is an excellent therapeutic agent in controlling the diarrheas of infancy. Great difficulty, however, has been experienced in making it in the home and it is not commercially available in liquid form in America. Stoeltzner, of Halle, has suggested a dried preparation of Finkelstein's milk which is known as larosan and which is an agent of inestimable value in the management of the acid diarrheas of infancy. Larosan consists of chemically pure casein, precipitated from milk, and which has been rendered soluble in hot milk by exact neutralization with calcium hydroxide and subsequent evaporation to dryness; it is therefore a soluble calcium caseinate. It is a white powder of light consistency and is really an evaporated or dried albumin milk. My method of procedure, therefore, following the hunger period, is to start the infant on a weak formula as follows:

Skim milk 5 oz.
 Water15 oz.
 Salta pinch
 Larosan1 to 2 packages
 (These packages contain two thirds of an ounce of the dried powder.)
 Unsweetened cocoa2 teaspoonfuls
 Saccharin1 gr.

The water and milk and salt are mixed together and the larosan is added slowly, stirring to prevent the formation of lumps. Strain, bring to boiling point, stir, and while hot add the cocoa without lumps. Strain and whip with an egg beater till cool and add sufficient cool boiled water to bring the total bulk up to twenty ounces. Feed from two to six or more ounces every three hours according to the age and appetite of the infant. The mixture is of course warmed before feeding. If a sediment appears it does no harm. It is only necessary to remember to shake the container thoroughly before pouring the necessary ration. The preparation may be made without cocoa but in my experience the use of this agent has proved to be of extreme value. It is nutritious as well as astringent and therefore constipating and further adds materially to the taste of the mixture and most infants take to it readily. The preparation, however, without the cocoa is not unpleasant to the taste if properly sweetened, and even in cases where it appears desirable to withhold milk entirely, may be used simply by diluting it with water and adding some sweetening agent.

Following the use of this mixture, together with the chalk, fuller's earth and kino mixture, it may be predicted with almost mathematical accuracy that within twenty-four to forty-eight hours the infant

will pass a thick brown, constipated stool. If the cocoa has been omitted the stool will be yellow. The reaction will be alkaline.

It is necessary, however, to proceed further with the nourishment because the mixture above ordered is not sufficiently strong to nourish. Hence an ounce of milk replaces an ounce of water from day to day until a mixture is reached that appears sufficient at least to maintain tissue balance. While the larosan and cocoa mixtures are not regarded as permanent foods, nevertheless the error is usually made in removing them too soon. They should be used until a certain feeling of surety prevails that relapses will not occur. After the stools have become thick and brown or thick and yellow, if cocoa has not been employed, carbohydrate is cautiously added. My own preference is for cane sugar as experience and habit of years have convinced me that it is as serviceable and as least likely to disagree as any of the sugars. This being so its accessibility is an additional reason for its use. At first one half of one per cent. of the total volume of formula is employed and the amount is gradually increased until three or four or five per cent. is reached. More than this is neither necessary nor safe. For those who so prefer, milk sugar or malt sugar in its various forms as found on the market may be substituted. A few formulas follow as illustrative of the method of procedure. Not any of these are intended as a criterion for use at any particular age. This must be decided at the time according to the infant's appetite and digestive powers and its general condition. The fundamental idea is to start the milk weak and then gradually work it up. As the carbohydrate is increased the saccharine is gradually omitted.

Skim milk 6 oz.
 Water14 oz.
 Saltpinch
 Larosan1 to 2 packages
 Saccharin1 gr.
 Cocoa (unsweetened)2 teaspoonfuls

Skim milk 7 oz.
 Water13 oz.
 Saltpinch
 Larosan1 to 1½ packages
 Saccharin1 gr.
 Sugar1 teaspoonful
 Unsweetened cocoa2 teaspoonfuls

Skim milk 8 oz.
 Water12 oz.
 Saltpinch
 Larosan1 package
 Saccharin½ gr.
 Sugar2 teaspoonfuls
 Unsweetened cocoa2 teaspoonfuls

Skim milk 9 oz.
 Water11 oz.
 Saltpinch
 Larosan1 package
 Saccharin½ gr.
 Sugar3 to 4 teaspoonfuls
 Unsweetened cocoa2 teaspoonfuls

Skim milk10 oz.
 Water10 oz.
 Saltpinch
 Larosan1 package
 Saccharinomitted
 Sugar5 to 6 teaspoonfuls
 Unsweetened cocoa2 teaspoonfuls

Skim milk	10 oz.
Water	10 oz.
Salt	pinch
Larosan	½ package
Sugar .....	.5 to 7 teaspoonfuls
Unsweetened cocoa	1 teaspoonful

And so the method proceeds until a strength suitable to the individual is reached. This may be a partially diluted or undiluted skim milk; diluted partly skim milk, or diluted whole milk or whole milk. By this method of gradual increase of strength, meanwhile continuing the larosan and cocoa, the general weight is not only maintained but an actual increase may occur. This is particularly so if well cooked cereal, such as farina or cream of wheat, is added to the diet, first once, then twice a day, just preceding a bottle feeding. Small amounts are first employed as one to two teaspoonfuls, and these are gradually increased to two to three table-spoonfuls. The cereal after cooking in water in a double boiler for two hours is served with a pinch of salt, a sprinkle of sugar and a half an ounce or so of milk, and the same of water and brought to what would be the boiling point (too thick to boil) a second time. If the infant is beyond six or seven months and not too feeble, the gradual addition of mashed baked sieved potato with some mashed sieved greens, such as spinach, should be started once daily—preferably around the noon hour.

There now develops in each case a time when the albumin milk feeding is no longer needed and the larosan and cocoa are omitted from the formula. When to make this change to a simple formula of boiled diluted whole, or diluted skimmed or partly skimmed milk, must be decided for each individual case. Certain criteria are of value in making this decision and the most reliable is the condition of the stool. If this is thick and mushy and free from blood and mucus, the larosan and cocoa may be omitted. Undue haste, however, in doing this or in increasing the fat and sugar content of the milk mixture, will lead to a relapse. Relapses are treated exactly as original attacks including the use of a hunger period and tea feeding as previously described. It is worth repeating that the weak saccharated tea may be continued throughout the course of the case, being used simply as a drink between feeds. Medication with the mixture of calcium carbonate, fuller's earth, and the other substances, should also be continued for several days throughout the course of the case, in gradually lengthening intervals, but care should be exercised not to discontinue it too soon.

After the attack, great care is needed to preclude relapses by preventing the influence of the factors which were responsible for the first attack. Milk should be boiled, overfeeding should be avoided, rich milks and cream should be restricted and great care exercised in feeding sugar. The depressing effects of external heat must be combated if summer prevail. Two drops of tincture of nux vomica in a little water and given before feeding will be useful.

INFECTIOUS DIARRHEA.

The general management of these cases differs very little from those of the noninfectious type, except that one must proceed more cautiously in in-

roducing milk of any kind in the diet. The results of treatment are by no means as good and many infants succumb to the toxic effects and to dehydration and demineralization. Sera have given very little encouragement for their use. An attempt should be made to discover the dysentery organism. The free use of water and the intraperitoneal injection of saline and of tannic acid irrigations may be lifesaving. Alkalis, such as potassium citrate and bicarbonate of soda, in large doses by the mouth, are often useful in combating acidosis. Morphine, brandy, digitalis, Siberian musk and camphor may, each or all, be useful when indications for such remedies arise.

ILLUSTRATIVE CASES.

CASE I.—Baby H., ten months old, breastfed; had been ill six weeks when first seen. Birth weight was nine pounds; weight at beginning of illness twenty pounds; weight after six weeks of illness, fifteen pounds. Symptoms began with vomiting. Whole raw milk had been given, and fever and diarrhea were present. The patient had received during six weeks of treatment various proprietary foods, purgatives and homeopathic remedies. The infant was wasted, irritable and toxic; temperature was 103° F.; vomiting; fifteen and more stools daily containing mucus, undigested milk, and some blood, reaction acid. Treatment for the first twenty-four hours: hunger period with saccharated tea, hydrotherapy, simple fever mixture, colonic irrigations with one per cent. tannic acid solution; temperature 100° F. morning and evening. On the second day, tea was continued as a drink, and one dram of the diarrhea mixture, as detailed above, was administered every three hours. Tannic acid irrigations were continued; temperature 99° F., vomiting ceased, bowels had not moved. The following preparation was ordered:

Skim milk	10 oz.
Water	20 oz.
Larosan	3 packages
Salt	a pinch
Saccharin .....	.1 gr.
Cocoa (unsweetened)	3 teaspoonfuls

Fed six ounces every three hours.

Third day, temperature 99° F., no vomiting; bowels moved twice, thick chocolate stools, some mucus, no blood. Tea was continued as a drink. Similar treatment was continued for two weeks, gradually increasing the strength of the formula. Diarrhea mixture and saccharated tea were continued during this time. Irrigations were stopped after one week. Carbohydrate was added gradually to the diet. Larosan and cocoa were stopped at this time and feeding continued with the following:

Skim milk	20 oz.
Water	10 oz.
Cane sugar	1 oz.

Powdered flour ball with pancreatin and bicarbonate of soda (one ounce of the former and five grains and fifteen grains, respectively, of the latter). These substances added to the formula at 100° F. for fifteen minutes, and then brought to boil. Seven ounces every three hours.

In addition cereal was fed twice daily and once daily mashed baked sieved potato and mashed sieved spinach. There was some tympany so two drops of tincture of nux vomica and two drops of tincture of belladonna, four times a day, were ordered.

Bowels were normal, moved twice daily, free of mucus and blood. Infant was contented, weight sixteen pounds six ounces. At the present writing it weighs twenty-two pounds, has cut four teeth without disturbance, and is walking at thirteen months. It is receiving whole boiled milk, cereal, egg, vegetables and minced chicken and beef and baked apple.

CASE II.—W. B., male, five months, September 23, 1920. Birth weight eight pounds twelve ounces, present weight nine pounds twelve ounces. It was breast fed for one day. It did not thrive; suffered from diarrhea. It was now on barley water and milk mixture. Treatment consisted of a hunger period, saccharated tea, and the diarrhea mixture.

Skim milk 7.5 oz.
 Water 22.5 oz.
 Salt pinch
 Cane sugar ½ oz.
 Larosan 2 packages
 Cocoa 3 teaspoonfuls

Six ounces every three hours.

On September 25, 1920, its weight was nine pounds nine ounces; bowel movement better. Ordered two tablespoonfuls of cereal in the morning and the evening just preceding the following formula:

Skim milk 10 oz.
 Water 20 oz.
 Salt pinch
 Sugar ¾ oz.
 Larosan 2 packages
 Cocoa 2 teaspoonfuls

On September 27th the infant's weight was nine pounds ten ounces. Condition continued the same. Bowel movements were thick and brown.

On September 29th the weight was ten pounds two ounces. Bowel movements were thick and brown, two daily. The following mixture was ordered:

Skim milk 11 oz.
 Water 19 oz.
 Salt pinch
 Sugar ¾ oz.

Larosan and cocoa reduced to one half amount.

This method of gradually reducing the cocoa and larosan was continued with increase of skim milk and decrease of diluent and gradual increase of sugar for about two weeks when a change was made to a simple milk formula with cereal fed twice a day. Infant improved in weight and general condition. On November 15, 1920, it weighed sixteen pounds and beside cereal, egg, mashed potato and spinach it was taking the following formula:

Skim milk 24 oz.
 Water 6 oz.
 Salt pinch
 Sugar 1½ oz.

Eight ounces every three hours.

CASE III.—A. E., four months old on September 9, 1920. Birth weight was seven pounds five ounces, present weight ten pounds eight ounces. Was breastfed for sixteen days; now getting boiled water and milk and Robinson's barley flour. Complaint—diarrhea, fifteen movements daily; buttocks excoriated, no vomiting, no elevation in temperature, stools green, mucus, curds, acid. Treatment was started with a hunger period, saccharated tea, diarrhea mixture,

and after twenty-four hours the following mixture:

Skim milk 5 oz.
 Water 15 oz.
 Salt pinch
 Saccharin 1 gr.
 Larosan 1 package
 Cocoa 2 teaspoonfuls

On September 11, 1920, the infant was constipated, bowel movements dark brown, three daily.

CASE IV.—L. G., female, fourteen months. Birth weight eight pounds eight ounces, present weight twenty pounds. Complaint, diarrhea for one week, with ten to twelve watery acid movements daily, buttocks excoriated, temperature normal. Saccharated tea was given for twenty-four hours, followed by diarrhea mixture. No movement appeared after hunger period was instituted until thirty-six hours later.

Skim milk 20 oz.
 Water 20 oz.
 Salt pinch
 Larosan 2 packages
 Saccharin 1 gr.

The next bowel movement was thick, yellow, constipated smooth, alkaline.

In all there are records of some forty-five to fifty office cases wherein this method of treatment was followed and in all wherein directions were carried out the results were good. In a few instances the infants refused the mixture. Here the addition of cocoa usually made it acceptable, although in two or three instances, even after persistence, it was refused. In such cases reliance was placed upon saccharin sweetened skim milk mixtures thickened with powdered arrowroot (two drams to the pint of formula) or to the same mixtures to which powdered flour ball and pancreatin with bicarbonate of soda had been added. Space forbids further details of cases treated. Those described are sufficient to make clear the method pursued.

In the infectious type of the disease, except in true dysentery, we possess no special therapy and must rely upon the measures enumerated. Sera are disappointing although good seems to have followed the use of antidysenteric and of antistreptococcic serum in a few cases. Emetin should also be employed where bloody mucous stools persist. In these cases high temperature and toxemia must be vigorously combated. Cold bathing is always dangerous in infants.

SUMMARY.

1. Purgative: To be employed if temperature and toxemia are pronounced. Castor oil, or calomel, if vomiting does not yield to a single lavage, to be followed by castor oil.

2. Hydrotherapy.

3. Hunger period for twenty-four to forty-eight hours. During this time give freely of saccharated tea (one grain to a quart) regardless of vomiting and continue same throughout treatment as a drink.

4. Feeding of diluted skim milk mixture sweetened with saccharin (one grain to twenty ounces) and containing larosan with or without unsweetened cocoa. The skim milk and the larosan mixture may be replaced by Finkelstein's eiweissmilch if this is available. Carbohydrate is gradually added, preferably cane sugar, and strength of formula otherwise

gradually increased. Larosan cocoa and sugar gradually are reduced as mixture becomes stronger. Formula may then be boiled with arrowroot or flour ball, pancreatin and bicarbonate of soda may be added. Cereals and vegetables (comminuted) are gradually added.

5. Diarrhea mixture continued throughout treatment.

6. Potassium citrate in large dose if acidosis is marked.

7. Irrigations of one half to one per cent. tannic acid solution if stools contain blood.

8. Demineralization and dehydration combated by intraperitoneal injection of saline, or intravenous injection of saline, glucose, or alkaline solutions if acidosis is marked.

2011 CHESTNUT STREET.

Treatment of Ununited Fractures.—M. S. Henderson (*Annals of Surgery*, April, 1921) gives the following résumé: As a result of our experience in the treatment of ununited fractures we believe that the bone graft is primarily the method of choice, but there are certain conditions in which it is probably not the best method. Frequently in operations on certain ununited fractures of the femur with much fibrous tissue and abundant callus, in which bleeding is very free and cannot be controlled absolutely, we have found it better to use metal or beef bone plates, which are more easily applied than autogenous bone grafts. Beef bone plates and screws are not irritating and have sufficient strength to stand the strain. In treating ununited fractures of the tibia the inlay graft is probably the method of choice; this, like all bone grafts, should be held firmly in place by the aid of beef bone screws. In the femur and humerus, and in the radius and ulna, we prefer the massive bone graft which permits the approximation of the cancellous tissue of the graft and of the fragments.

Treatment of Fracture of the Forearm in Children.—Jacob Grossman (*Journal of Orthopedic Surgery*, May, 1921) concludes as follows: 1. Where, for any length of time, infants and children refuse to use their forearms, after having sustained an injury, fracture should be suspected. 2. Colles's fracture occurs rarely in infants and children. 3. Fracture may be present, even though the cardinal signs of fracture are lacking. These fractures are usually of the subperiosteal variety. Pencil tenderness is the diagnostic sign. 4. Epiphyseal separation of the lower end of the radius should be looked for in all cases with injured forearm. It occurs often enough to be considered. 5. Plaster of Paris bandages are by far more efficient than splints and should be given the preference in the treatment of fractures. 6. Proper immobilization is as important as proper reduction in obtaining a successful issue in the treatment of fractures. 7. Shorter periods of immobilization, early massage and passive movements should be employed in children. 8. A pad between the shafts of the fractured bones, as recommended by many, for the purpose of preventing fusion of the fractures, is unnecessary as it could not separate the bone ends without exerting injurious pressure upon the circulation.

Treatment of Scoliosis.—S. Kleinberg (*Surgery, Gynecology and Obstetrics*, April, 1921) asserts that the most effective means of recognizing scoliosis early is by regular frequent examinations of the naked backs of all school children. Corrective treatment should be instituted as soon as the curvature of the spine is discovered. Treatment should be carried on uninterruptedly for years until improvement has been obtained and until such time as will reasonably assure arrest of the deformity. Treatment with the spine in extension is at present the best form of treatment for it enables us to arrest the progress of the deformity and in many instances to reduce the curvature. It is the least uncomfortable treatment and does not cause malformation of the chest. The essential feature of the treatment is keeping the patient in a position that is opposite to that of the deformity. During change of jackets there must be no opportunity for relapse of the deformity.

Abortive Serum Treatment of Typhoid Fever. G. Etienne (*Paris médical*, March 19, 1921) states that Rodet's antityphoid serum is capable of aborting typhoid fever in a large proportion of cases when the treatment is begun between the eighth and tenth days of the disease. The fastigium is done away with and the period of decline usually begins between the tenth and twelfth days of the disease. This result was obtained in fifteen out of twenty-three cases thus treated. In the remaining eight cases the result was interfered with either through failure of the temperature and general condition to show consentaneous improvement, through secondary infection, or through actual failure of the treatment to cause anything more than an attenuation of the typhoid manifestations. However severe the typhoid case may be at the start, it generally follows the mild course of typhoid in a vaccinated individual when the serum is administered before the tenth day.

Ultimate Results of Laryngectomy for Cancer of the Larynx.—E. J. Moure (*Bulletin de l'Académie de médecine*, March 1, 1921) maintains that if cases of cancer of the larynx could be subjected to early operation, permanent cure would be the rule in this disorder, upon which neither radium nor the x rays have as yet seemed to have any hold. Out of thirty-one cases dealt with surgically by the author, two patients died soon after the operation, including one with an abscessed lung. Twelve died in six months to a year from local recurrence. Four more died two or three years after the operation, from intercurrent disorders. Eleven appear to have been definitely cured, remaining well for periods of from one to nine years after the operation. The two other cases were lost sight of. In general, it seems that if recurrence has not taken place at the end of one year, either locally or in the cervical glands, the case may be considered cured. Laryngectomy may now be looked upon as a relatively mild operation which gives very useful results if performed under favorable circumstance and in due time. The author has improved the operation of late by making only a single broad flap, which gives better exposure of the excised organ and facilitates subsequent plastic surgery.

X Ray Treatment in Acute Dyspnea the Result of Tracheobronchial Glandular Enlargement.—D'Elsnitz and Carcopino (*Bulletins et mémoires de la Société médicale des Hôpitaux de Paris*, March 10, 1921) report the case of a child aged three years who, upon admission to a hospital, was at once isolated for diphtheria and given antitoxin, having been thought suffering from laryngeal diphtheria. The history obtained was that the child, apparently well the preceding evening, had waked up in the night with severe difficulty in breathing. Examination showed her face somewhat cyanosed, with marked dyspnea and infrasternal depression during inspiration, hoarse voice, temperature 39° C., pulse very frequent, throat slightly reddened, breath sounds reduced especially on one side, and absence of abnormal thymic dullness. Immediate x ray examination revealed a marked glandular shadow masking the entire middle portion of the retrocardiac space and extending more distinctly toward the right; there was no thymic shadow. The x rays were then used for therapeutic purposes over the chest for fifteen minutes; this caused immediate betterment of breathing, and the next day the child seemed well and remained so thereafter. The conclusion reached from this and other cases is that while the x rays cannot as yet be said to exert a selective action in chronic enlargement of mediastinal glands, they constitute a useful emergency treatment in acute cases with pronounced dyspnea.

Incontinence of Urine in Childhood.—Charles E. Sundell (*Practitioner*, April, 1921) says that it is necessary to investigate every case of enuresis very fully, and to take into account all the factors which may have a bearing upon it. The most successful line of treatment is a triple one: 1. Deal with the associated conditions, if they are present; 2, build up the health of the child with a special regard for its nervous balance; and 3, form and confirm a habit of recognition of the bladder's desire to empty itself. The method of treatment upon the first line has been indicated—it is at best subsidiary. The second line of treatment includes attention to the whole nutrition, habits of work, play and rest, and an estimation of the general health of the child. Arsenic in small doses is the most useful drug, and can be combined with strychnine with advantage. Attempts to influence the lumbosacral cord directly by intrathecal injections of normal saline are a crude procedure; there is no real evidence that the spinal centre is at fault in these cases, and this line of treatment is unjustifiable. The main effort in the campaign against enuresis must be directed to the brain and consciousness, and most important of all is the cordial, continuous, and self-sacrificing cooperation of the mother or nurse. Under similar conditions of life and activity during the waking hours, and with similar amounts of food and fluid in the diet from day to day, it will be found that enuresis occurs at a fairly constant time during the night. In order to determine this hour the mother will have to sacrifice her sleep for several nights, look at the child every half hour, and record the time at which bedwetting occurs. By this means a timetable of enuresis for the individual child can be compiled, and it will be found that

this remains constant. When this timetable is once established, the rest is easy. The child must be roused a quarter of an hour before each bladder emptying is due. Habits are very easily formed in childhood, and treatment on these lines will quickly ensure that the child wakes spontaneously, and by a judicious system of rewards he can be trained to empty his bladder in the proper manner. This line of treatment is most successful, but it calls for two forms of sacrifice upon the part of the mother: first, complete supervision during the day so as to render each day's routine as nearly like its predecessor as possible; and second, the greater sacrifice of sleep for several nights in succession.

Colic in the Nursing Infant.—T. Wood Clarke (*New York State Journal of Medicine*, April, 1921) is sceptical of the frequent diagnosis of colic in the nursing infant. He believes that there are three conditions which produce symptoms commonly attributed to colic. These are hunger, otitis media, and temper. There is, of course, such a thing as true colic in infancy; the irregularly fed infant, the infant fed on patent foods, or the infant getting too much fat or sugar may have true colic. Appendicitis, peritonitis or intestinal obstruction will give a real entity, but in such cases the baby looks and is ill. The point to be brought out is that in the properly breastfed infant, and the decently fed bottle baby, the symptom complex diagnosed by the family and treated by the physician as colic, if carefully studied, will be found in the vast majority of cases to be in no way associated with intestinal spasms but to be due to hunger, earache, or temper.

Clinical Study of Tuberculosis in Children.—Abraham Levinson (*Medical Record*, May 7, 1921) summarizes his study of three hundred children, most of whom had come in contact with tuberculous people. Of these children one hundred and forty-one reacted positively to the von Pirquet test, eighty-three were negative and seventy-six were still pending on diagnosis. Of the one hundred and forty-one positive cases ninety per cent. had only a latent infection, and in only three cases was there active pulmonary tuberculosis. In ninety-eight per cent. of the latent cases the patients presented no subjective symptoms, and in ninety per cent. the patients were from four to eight per cent. under weight. Long eyelashes and visible veins over the chest were present in the greatest number of children with latent tuberculosis. Seventy-five per cent. of the positive cases showed hilus dullness and whispered bronchophony to the seventh dorsal vertebra. The x ray usually confirmed the hilus dullness by showing a shadow over the hilus, and often calcified spots in the substance of the lungs, and radiating toward the apex. The Eustace Smith sign of venous hum over the aortic region was very infrequent in this series. Tuberculin tests, when positive, should establish a diagnosis of the presence of tuberculosis in children. The classification of the type of infection must be made by the subjective and objective symptoms and by the x ray findings. Latent tuberculosis requires no active treatment. All children who have been in contact with a tuberculous individual should be under observation in order to establish the diagnosis and institute treatment.

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NEW YORK, WEDNESDAY, AUGUST 3, 1921.

Obituary.

WALLACE C. ABBOTT, M. D.,
of Chicago.

Dr. Wallace Calvin Abbott, who died at his home, 4605 N. Hermitage Avenue, Chicago, July 4, 1921, was born in Bridgewater, Vermont, October 12, 1857. His early education was obtained at the State Normal School, Randolph, Vt., the St. Johnsbury Academy, St. Johnsbury, Vt., and Dartmouth College, Hanover, N. H. Coming west, he worked his way through the University of Michigan, winning his degree of Doctor of Medicine in 1885. The following year he engaged in the practice of medicine in Chicago, building up a large practice on the North Side and winning many friends. It was during this time that Dr. Abbott established the Abbott Alkaloidal Company, now known as the Abbott Laboratories, of which firm he was president continuously from the time of its establishment until his death.

For several years previous to his decease, Dr. Abbott had been in ill health. Anticipating his active retirement from the large and successful business which he had founded, he placed the conduct of the Abbott Laboratories largely in the hands of his older employees, under a generous cooperative reorganization plan on which it has been operating for more than two years.

Dr. Abbott was a man of broad vision and great energy. He was an organizer of rare ability, warmhearted and beloved by his employees, business associates and hundreds whom he had befriended. He was a pioneer in the field of alkaloidal medication. He labored incessantly through his writings, and personal contact with thousands of physicians, to bring about a more careful study of the patient, and the treatment of separate symptoms as they

developed, as contrasted with the older method of treating by disease names only. His influence upon the medical profession in this respect has been profound.

Dr. Abbott was coauthor, with Dr. William F. Waugh, of several medical books, including *The Practice of Medicine* and *Positive Therapeutics*. He was, also, editor in chief of *The American Journal of Clinical Medicine*, now in its twenty-eighth year. For the past five years he had encouraged extensive research work along the line of new medicinal chemicals. As a result, a number of the remedies, formerly made only in Europe, are now manufactured by the Abbott Laboratories.

Dr. Abbott was a member of the Ravenswood Methodist Church, the American Medical Association, the Illinois Medical Society, the Chicago Medical Society, the Medical Editors' Association, American Drug Manufacturers' Association, American Pharmaceutical Manufacturers' Association, Ravenswood Lodge 777, F. & A. M., the Oriental Consistory and the Shrine.

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Letters to the Editors.

PROHIBITION AND OTHER THINGS.

To the Editor: CANANDAIGUA, N. Y., July 8, 1921.

On looking over the Endocrinology Number of March 6th a reader must be impressed with the remarkable collection of articles relating to that interesting aspect of medicine that you have brought together in this great number, and when he considers the large amount of valuable material you have presented in the pages of the Journal in previous numbers he will cordially agree with the editors that you are rendering a distinct service to the medical profession in publishing these important papers by the masters of their respective fields.

The editorial article entitled Reformer or Idealist in the same number is an admirable crystallization of a number of ideas which I think most physicians must have entertained in the past few years, but in my judgment the force of the article is lost when you make the unfortunate comparison of the suppression of public prostitution with the suppression of the public manufacture and sale of alcoholic liquors or beverages. The similarity in the effects is imaginary, not real. You arouse only a smile in the reader's mind when you insinuate that more alcoholic liquor is consumed now than was consumed before prohibition and that prohibition has driven vast numbers of previously sober citizens to drink. It must have been a very hot, dry day when you banged that out of your typewriter! If you feel so badly about the difficulty of getting a drink why not go out and whip a couple of policemen or something? Surely it is a childish thing to insinuate that the hated 18th Amendment has made fools of a lot of ordinarily cautious, sensible folks. Perhaps you cannot see it now, but you editors (newspaper and periodical) are making plain humor in your puny efforts to oppose by every possible schoolgirl argument the enforcement of the prohibition law.

WILLIAM BRADY, M. D.

New York Medical Journal

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NEW YORK, WEDNESDAY, AUGUST 17, 1921.

WHOLE No. 2215.

The Predisposing Factor in Diphtheria

By BELA SCHICK, M. D.,

Vienna,

Professor of Diseases of Children, University of Vienna; First Assistant to Professor Von Pirquet.

The discovery of the diphtheria bacillus has brought about a fundamental change in our methods of diagnosis of this affection. While the clinical picture furnished the only means of identification in the past, we now insist upon a certain demonstration of the specific organism. This method has enabled us to recognize mild attacks, which formerly would have been overlooked or misinterpreted. Thus, scientific precision in the diagnosis of diphtheria—the aim of many researches—appeared to have become a practical reality. Bacteriologists laid down the rule that diphtheria was present whenever the bacilli were found, and that, on the other hand, there could be no diphtheria without the organism. While the latter view has been amply corroborated, the former requires certain modifications. It did not seem surprising that the causative organisms could be demonstrated in the throat of patients who had already recovered from the disease. Thus seventy-five per cent. of the patients harbor them in a state of varying virulence up to three weeks, while in two per cent. they were found after more than ninety days.

However, confusion arose when typical Klebs-Loeffler bacilli were encountered in the mucosa of the nose and throat of healthy persons, who had never suffered from diphtheria. This finding naturally caused some alarm, since it was thought at the time that the causative organism was of itself sufficient to provoke a typical attack of the disease. The presence of the diphtheria bacillus in healthy throats was cited as the basis for an attack on the accepted etiological factors of diphtheria by those who are ever ready to place obstacles in the path of scientific progress. Little did they realize that the discovery of so-called carriers was destined to enrich our knowledge of the fundamental nature of infectious diseases. These carriers have revealed the full significance of resistance of the body to infection; they afford a daily demonstration of the fact that the diphtheria bacillus is unable to attack his host unless the individual is predisposed to the infection.

It is instructive and interesting to note that man alone is susceptible to diphtheria, though the organ-

isms have a well nigh ubiquitous distribution throughout the animal kingdom. Even the guinea-pig, the classical subject of animal experiment, never becomes a victim of the disease under natural conditions, in spite of the fact that it is not immune to the effects of diphtheritic toxins, but, on the contrary, reacts strongly against them. It has, indeed, been possible to produce the affection in animals like guineapigs and rabbits, but the lesions resemble those seen in man only in certain respects, and one of the outstanding characteristics, the formation of a membrane, appears to be restricted to man.

Numerous investigations have furnished reasons for the belief that carriers acquire the organisms by direct contact with other carriers or with persons actually suffering from diphtheria. Naturally, the question arises, why only a comparatively limited number of individuals, in fact chiefly children between the ages of one and five, fall victims to the infection, while in the vast majority of the population the presence of the bacilli has no apparent consequences? Shortly after the Klebs-Loeffler bacilli had been identified as the causative organisms of diphtheria, it was demonstrated that antitoxic substances existed both in adults and in infants. These observations led to the formulation of the axiom that susceptibility to diphtheria was caused through lack of specific antibodies. Since that time it has been confirmed repeatedly that these antibodies are absent in children suffering from diphtheria.

On the other hand, the important fact has crystallized that diphtheria cannot occur in individuals possessing protective bodies. Examinations on a large scale only became possible after a way had been discovered of testing for the presence of antibodies by means of the intradermal injection of small quantities of toxin, namely, one fiftieth of the minimum lethal dose for a guineapig weighing 250 grams. The following figures are the results of extensive animal experiments carried out by Groer and Kassowitz at the Vienna Children's Clinic. If the skin shows no reaction to the injection, the result is negative. In positive cases a sharply defined spot of erythema is noticed with an area of infiltration possessing a diameter of ten to thirty

mm. A negative result not only proves the presence of antibodies, but also excludes the existence of diphtheria. This fact has been established by numerous observations carried out by me and by American physicians like Park and his assistants. There are but two exceptions to the rule: these occur in virulent or septic cases of diphtheria and in cachectic children. Otherwise, a negative intradermal reaction rules out the presence of diphtheria, even in cases where microscopic examination shows the presence of true diphtheria bacilli. In such instances we deal with angina occurring in carriers of the Klebs-Loeffler bacillus. It may be stated, therefore, that the intradermal test may carry more weight than the result of bacteriological examination.

A positive intradermal reaction only proves the absence of protective bodies—omitting from consideration a pseudoreaction, which need not be further discussed here. However, a positive result does not necessarily signify that the affection present is diphtheria. In this connection it is interesting to note that infection does not always occur, even if antibodies are absent. This applies also to patients who harbor organisms the virulence of which has been established by animal experiments. This phenomenon may be due to mechanical protection derived from the intact mucous membrane against bacterial invasion, just as the skin, as a rule, shuts out infection. This explanation is supported by the observation that infection may occur in chronic carriers who lack antibodies, after operations such as removal of tonsils or adenoids or turbinectomy. Investigations have shown that the presence or absence of protective bodies is a characteristic shared by all members of a family.

Most authorities hold that antibodies are the result of a previous attack of diphtheria. Indeed, it has been shown that they are present in individuals after an attack, who had been unprotected previously. It is important to determine how long antibodies thus formed remain in the organism, or, in other words, how long the immunity acquired persists. It has been shown that antibodies have almost completely disappeared a year after a severe attack; no large scale investigations have yet been carried out after milder infections. It has been suggested that the antibodies, which are found in normal individuals and which have an action identical with those appearing after infection (according to Groer and Kassowitz), are due to an attack of diphtheria within the preceding year. However, there are many objections to such an assumption. Thus a different origin of the antitoxin of so-called normal persons is by no means excluded; conceivably, their appearance might be a function of age.

Another aspect of the problem is the fact that the virulence of diphtheria shows such marked variations in different cases. We may ask, if the predisposition to a severe or a mild attack can be explained.

The early discoveries of bacteriology sought an explanation of these clinical variations by presuming either changes in the virulence of the infecting organism or the presence of a mixed infection. This statement cannot be maintained, since animal ex-

periment has clearly shown that no relation exists between the virulence of a strain or organisms and the severity of infection with this strain. I may add that I think animal experiments offer reliable data for deciding such problems. With regard to the malignant or so-called septic form of diphtheria most authors now agree that it is not a mixed infection, but that all the severe symptoms are due to the diphtheria bacillus. We must, therefore, again refer to the second factor, which plays an important rôle in all infectious processes, namely, individual susceptibility. Morbid symptoms are the expression of the reaction of body cells. It might, therefore, be suggested that variations exist in the susceptibility of cells to diphtheritic toxins, in other words, that severe cases are due to special idiosyncrasy. Though this does not offer a complete solution of the problem, it renders it at least more intelligible.

In my opinion an explanation of the clinical phenomena can be gathered by a consideration of the following observations.

We know that persons may be subject to repeated attacks of diphtheria. According to statements made above this implies that the antitoxins produced in response to the infection and leading to its termination, disappear after convalescence. Therefore, a fresh exposure may result in another attack, and the character of such repeated attacks may show variations; they may be milder or severer than the first. Karasawa and I have reported a case of four attacks of diphtheria, where the intensity of the morbid manifestations increased every time. Examination showed that the patient's serum did not contain any antibodies. Tests were continued throughout the whole period. It was found during the first attack that antitoxin did not appear until the third week after onset; however, in the fourth attack, it was present in abundant quantities after a few days. Though all antibodies formed during the first three attacks had disappeared, yet the infection had left its marks on the body. We may presume that cells had acquired the faculty of producing antitoxin more and more rapidly and abundantly. As Professor Pirquet defines it, the body had become allergic, and, as in the case of other infections, the phenomena accompanying the establishment of immunity took a more accelerated course. Since repeated infection leads to a more rapid and abundant formation of antitoxins, the successive attacks are brought to a speedier conclusion, thus the formation of membrane at the fauces is arrested sooner; in a word, the curative process commences earlier and terminates more quickly. Cases which manifest symptoms of increasing severity in successive attacks may be explained by assuming that the cells had failed to acquire the faculty of accelerated antitoxin formation.

If this explanation is true for multiple attacks occurring in one individual, it may also be held that differences in the severity of first attacks in different patients are based on the same principle. It need only be assumed that the speed and quantity of antitoxin formation is a function of the body cells with a tendency to individual variations. This has been a well established fact for a long time with regard to animals. For it was found that, while

some horses formed antitoxins rapidly and in abundance, others were so unsatisfactory in this respect as to be useless for the purpose. Identical variations can be observed in man, as the immunization experiments carried out by Behring have demonstrated.

It seems justifiable, therefore, to make use of experimental findings in the interpretation of clinical phenomena; thus it may be concluded that the function of antitoxin formation in diphtheria varies in different individuals both with regard to speed and quantity. We may assume that the morbid processes reach their climax and commence to decline as soon as antitoxin appears in the circulation, for from this moment newly formed toxin will be neutralized. It is, therefore, clear that the symptoms of an infection of a given virulence will be the milder the greater the speed and abundance of antitoxin formation. Thus, the most severe manifestations will be encountered in those individuals who are unable to produce it altogether or only after a long delay. In practice children are found to exhibit all grades of reaction between the two extremes. The mildest cases may be expected in patients who did in fact have traces of antitoxin before onset of the illness, though the amount in circulation was too small to be detected clinically

and insufficient to prevent infection. Such children would be specially adapted to react to the stimulus of circulating toxins by producing the necessary quantity of antibodies in the shortest space of time.

Thus we arrive at the conclusion that, in addition to the local protection derived from the intact and impregnable mucous membrane, there are two factors producing immunity against diphtheria: the one is humoral in nature and its presence is determined by demonstrating and measuring specific antibodies in the serum; the other is the cellular factor, which is based on the varying faculty of cells to generate antitoxins.

Humoral immunity signifies absolute protection as long as antibodies are circulating. Cellular immunity, while unable to prevent infection, determines the intensity and duration of the attack. The later and the less efficient the defensive mechanism of cells reacts to the morbid stimulus, the later the effects of the organisms and their toxins can be counteracted, and, naturally, the more opportunity is given for the diphtheria bacillus to develop its dangerous activity. In this way we are able to interpret the malignant forms of diphtheria, which are due to the complete inability of the body to defend itself against the toxins of diphtheria.

Medical Supervision of the Destitute Child*

By MAYNARD LADD, M. D.,
Boston,

Physician in Chief to the Children's Hospital of the Boston Dispensary.

The introduction of social service departments into the more progressive hospitals of the country has greatly increased the efficiency of the medical service rendered to the community. The introduction of medical departments into the social agencies which assume the care of destitute children promises to be equally revolutionary. I have been asked to discuss the way the problem of the destitute child has been handled in Boston, and to present the evidence on which we base our belief that the medical supervision of the boarded out child must be one of the first and most important considerations of any child placing association.

About five years ago Mr. J. Prentice Murphy, who was then secretary of the Boston Children's Aid Society, came to the conclusion that the medical supervision of the children boarded by the society was in many ways inadequate. The policy of placing children in boarding homes, instead of herding them in institutions, had proved a wise measure, but it made more difficult the problems of health supervision. The children were living in homes widely separated. The social visitors were not trained to handle medical problems which were continually arising and the foster mothers were still less competent to do so. Dependence had to be placed upon local physicians in a hundred different

localities. In cases of serious illness requiring hospital care it was difficult to obtain prompt and efficient service. The large group of babies who from necessity were separated from their mothers and fed on substitute foods could not receive the specialized care to which they were entitled. In short, while the social end of the job was scientifically and efficiently managed, the medical supervision of the children from a physician's point of view was very inadequate if not actually bad.

The problem which had to be worked out was how to establish an organization which would assume the medical supervision of the children, correlate the social end of the job, and provide proper hospital facilities for those who became seriously ill. The expense of such an organization was of primary importance. The group of children varying in number from five hundred to eight hundred cared for by the Boston Children's Aid Society and the Church Home Society was not large enough to warrant building up a separate medical department with the heavy overhead expense. The only solution appeared to be to utilize the facilities of a large hospital and so to arrange the work that it would not conflict with its regular service. Thanks to the cooperation and spirit of Mr. Michael M. Davis, then director, the Boston Dispensary was selected for the experiment and the chief of the children's department assumed the medical direc-

*Read before the Philadelphia Pediatric Society and Children's Bureau, May 10, 1921.

torship of the Boston Children's Aid Society and of the Church Home Society. The advantages of this arrangement were obvious. In the first place it centralized the medical care under one responsible head, who by virtue of his connection with the

infrequently happened that their favors have been returned when they have had to face the problem of providing for a convalescent child.

It is only fair to state that there were in the beginning many persons connected with the agencies, and with the dispensary, too, who were skeptical in regard to the success of the experiment. The conservative elements in the societies were fairly content with the services they had been rendering and felt that a preventive clinic would complicate the social problem without any corresponding advantages. Some of the dispensary staff, on the other hand, looked upon the children in the preventive clinic as well children involving no particular medical problem and as likely to prove a source of an-

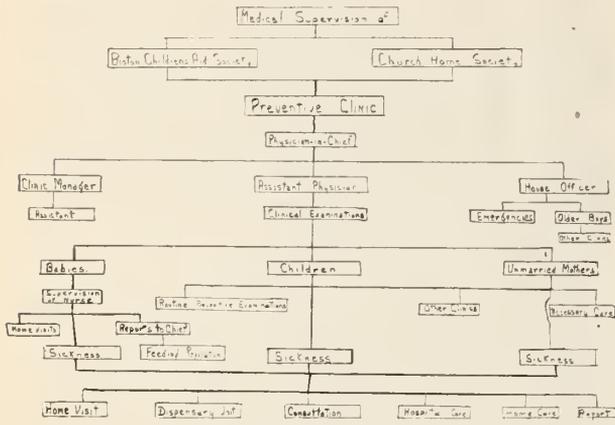


FIG. 1.—General scheme of organization.

dispensary was able to secure the cooperation of the different departments. Small but for the time sufficiently large quarters were set aside for the use of the so-called preventive clinic, with its own corps of workers. The facilities of the clinical laboratory, the x ray laboratory, and the special departments, such as eye, ear, nose, and throat, gynecological and orthopedic, were made available without prohibitive overhead expense. The children's hospital of thirty beds became the natural centre for seriously ill children, thus relieving the foster mothers and social visitors of responsibilities they should not

LABORATORY EXAMINATIONS - SMEARS - WASSERMANS - URINES	
VAGINAL SMEARS (over period of two years)	
Total number taken	53
Negative Smears	49
Positive Smears	4
WASSERMANS (over period of five years)	
Total number taken	214
Negative Wassermans	205
Positive Wassermans	9
URINES (over period of two years)	
Total number of urines	202
Negative Findings (examination in itself)	199
Negative Findings (Positive treatment)	76
Positive Findings (examination in itself)	33
Positive Findings (Positive treatment)	2

FIG. 3.—Data in regard to certain of these clinical tests. A child with a positive vaginal smear would not be accepted by the societies. In two years the occurrence of gonococcal infections has been limited to four cases. We made one hundred consecutive Wassermann tests with only four positive reactions. Since then we have exercised our judgment as to cases which might be placed in a suspicious class. Vaginal smears and Wassermann reactions are made in all cases in which there is physical evidence of vaginal inflammation or discharge; in all unmarried mothers and illegitimate children, in all court cases and children with sex delinquencies, and whenever the history or physical examination leads to a suspicion of venereal disease. About twenty-five per cent. of the children are tested, thus allowing a large margin for error in judgment. Out of 214 blood specimens taken, nine have been positive. Routine Wassermann reactions in groups of children such as these we are speaking of, in our opinion are an unnecessary expense and annoyance. The cases selected for tests could in my opinion be cut down to much less than twenty-five per cent of the whole number, without risk of overlooking an obscure case of congenital syphilis. Undoubtedly this question must be judged differently in different communities, as the incidence of congenital syphilis varies greatly. In a similar examination of the urines in seventy-six consecutive cases (whenever a specimen could be obtained at the first visit) only two gave positive findings. Of 142 selected or suspicious cases, thirty-three gave positive findings. There is much more to be said in favor of routine urine examinations in groups such as ours, but there are physical difficulties in securing fresh specimens when patients are placed miles from the hospital centre and we cannot and do not secure the urine in every case. Whenever a child is reported ill, or in the convalescence from most of the infectious and contagious diseases, great efforts are made to secure specimens for examination.

USE of DISPENSARY CLINICS (over period of four years)	
Preventive	4620
Dental	1137
EYE Nose Throat	1113
EAR	513
SKIN	280
Gyn.	241
Surgical	219
Orthopedic	147
Nerve	56
Massage	27
Genito-urinary	13
Food	3
Rectal	1
Total use of other clinics	3750
Total number of laboratory examinations	1018

FIG. 2.—Showing the extent to which the various departments of the dispensary are utilized. The sum total of cases examined and treated in other departments almost equals the visits to the preventive clinic itself. This is convincing proof of the many medical problems which arise when one conscientiously supervises the health of a group of children. In the last fourteen months we have made 202 routine examinations of the eyes of children of school age, with the result that fifty-one children have been fitted with glasses. Note also the fact that in four years we have had only thirteen cases of scabies, a disease which has proved one of the most difficult conditions to handle in some of our cities.

be forced to assume. In the care of contagious diseases, the special hospitals were utilized, but their cooperation was more easily obtained from an organized department of the dispensary than by the individual efforts of the agencies—and it has not

noyance and of very little medical interest. However, the machinery was set in motion and it has now been running for five years. Its usefulness has been fully demonstrated—to the agencies as a means of lowering mortality and morbidity, and to the dispensary as an added service which it has been able to render the community.

The organization of the clinic may be considered in more detail by separating it into groups, all of which are under the one management but with responsibilities sharply defined. The two children's societies have offices located outside of the dispensary building. Their general offices are concerned with social, financial, and administrative details of their work. With them rests the selection of cases,

the study and social diagnoses of families, the preparation of histories of children received, the selection of foster homes into which the children are to be sent, the supervision and training of the foster parents, the selection and training of the nonmedi-

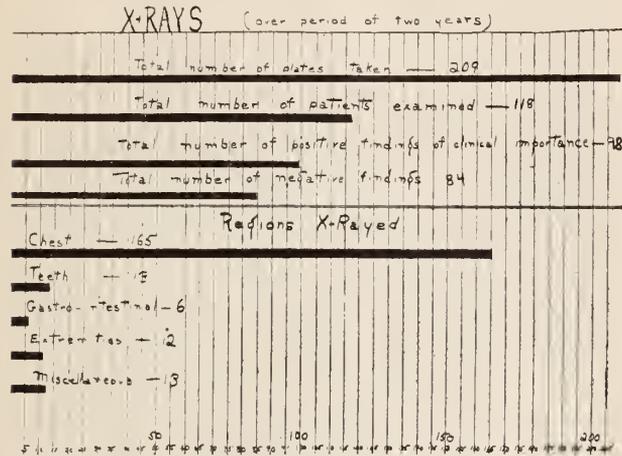


FIG. 4.—Very liberal use of the x ray is made in our first examination. Many of our children have been exposed to tuberculosis, many are undernourished. It is of practical importance to have a record of the chest as shown in the x ray, not only to show lesions which might be overlooked by the ordinary methods of examination, but as a basis of comparison for future examinations. The result of such examination—about half of these plates gave positive findings of clinical importance. If the resources of the societies and clinic permitted I should favor a considerable increase in the number of x ray examinations. As it is now, about one in ten children are x rayed, the thorax being selected in the majority of cases.

cal workers, the social case work supervision of the medical workers, the provision and distribution of special foods, etc., which as a result of their own

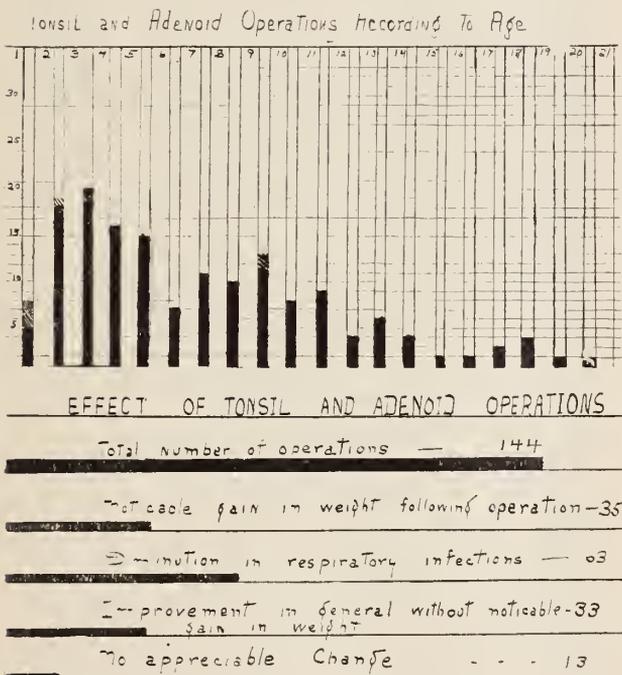


FIG. 5.—Represents a study of 144 tonsil and adenoid operations upon children carefully selected for some definite state of ill health. This group represents about twelve per cent. of the whole number of children accepted by the societies. Thirty-five of this number made a noticeable gain in weight following the operation; sixty-three showed a diminution in respiratory infections, and thirty-three were improved in their general condition without noticeable improvement in weight. In thirteen only was there no appreciable change in condition. The cases are brought to the hospital of the dispensary by appointment in the morning, are examined on their arrival for any evidence of an acute infection contraindicating operation, and remain in the hospital under observation over night, or for longer periods in case of any unfavorable development. There have been no accidents or serious complications in this group.

observation, or that of the medical director, are found to be necessary.

Theoretically, the final disposition of the child, and generally its original acceptance, are decided by the respective societies through their own office group. In special cases, such as with feebleminded children, children still undernourished or convalescing from disease, syphilitic or tuberculous children, the medical director is consulted and the disposition of the child is by mutual consent. Actually, however, the general current of all social case work of these two societies is determined by the advice and counsel of

GENERAL STATISTICS

New patients	1127
Patients supervised each year (average)	530
Home visits (twenty-five months)	1284
Laboratory tests	1018
X ray examinations	334
Wassermann tests	197
Admissions to hospitals	337
Adenoid and tonsil operations	157
Visits paid to all clinics	8432
Reports from social workers, nurses, etc. (three years)	3298

YEARLY MORTALITY STATISTICS

Individual cases under supervision	1127
Total deaths (four years)	24
Average number of deaths a year	6 or
For each 282 new patients	2.12%
For average number carried each year (530)	1.13%

MORTALITY BY AGE

	Cases	Deaths	Percent
Birth to 1 year	302	9	3.0
1 to 2 years	157	9	5.7
2 to 5 years (inclusive)	336	3	0.9
6 to 10 years (inclusive)	336	0	0.0
11 to 16 years (inclusive)	290	3	1.0

CAUSES OF DEATH

Acute toxemia with cerebral hemorrhage	1
Chorea, endocarditis, nephritis	1
Status lymphaticus	2
Meningitis	3
Syphilis	1
Pneumonia	7
Pulmonary tuberculosis	1
Malnutrition and intestinal indigestion	3
Pertussis	2
Anterior mediastinal abscess	1
Acute encephalitis	1
Septicemia, nasopharyngitis	1

MEDICAL SUPERVISION IN ITS EFFECTS UPON DEVELOPMENT
THREE YEAR PERIOD—1916 TO 1919

Age	No. of cases	Time supervised Months	Entrance		Weight Development Discharge		Gain or Loss
			Percent	Percent	Percent	Percent	
Birth to 1 year	135	13.6	80.7	89.3	8.6	gained	
1 to 2 years	57	12	86.2	89.1	2.9	gained	
2 to 5 years (inclusive)	128	13	97.7	97.6	0.1	lost	
6 to 10 years (inclusive)	133	13.5	97.2	98.2	1.0	gained	
11 to 16 years (inclusive)	102	15	100.0	99.0	1.0	lost	

FIG. 6.—A statistical study of four years of supervision, 1916 to 1920.

the medical director. As for example, frequently when from the viewpoint of family conditions the child might well be returned to its own people, the medical director will order a longer period of foster home care because of some special physical or health need which exists in the child.

The preventive clinic at the Boston Dispensary is organized under the control of the medical director of the two societies, whose duties are those of a consultant in all cases involving special decisions or judgments, and who also directs, as his particular charge, the feeding of infants and undernourished children. The routine examinations and home visits are largely made by a full time physician, at present Dr. Leslie H. Macmillan. Her mornings are spent at the dispensary making first examinations and reexaminations; her afternoons in visiting

in their homes children who are reported by the visiting nurses or social workers as ill, but not ill enough to necessitate hospital care.

Both societies follow the plan of having trained graduate registered nurses for the medical social

fitted to influence. The older boys, especially those over puberty, have their first complete examination by the director or by some other physician at the dispensary designated by him.

Notes on all examinations are made in triplicate. One copy goes to the office of the society responsible for the child, one to the dispensary general record files for the benefit of other clinics to which the child may be referred for diagnosis or treatment, and the third is kept on file in the preventive clinic office. The central office is thus informed automatically of everything that transpires in the hospital clinics, and can utilize the knowledge thus obtained in their followup social work and in the final disposition of the child.

A child on entrance is subjected to a thorough physical examination and is referred to special departments when the director or assistant physician thinks it is desirable. When this is done a worker in the clinic personally conducts the child to the chief of the special clinic, calls his attention to the particular points under discussion, and gets a decision promptly and without waiting his turn. If the case is urgent, as for example where carious teeth or diseased tonsils must be removed, the direc-

INFANT'S WEIGHT CHART.

Revised by J. F. CROZER GIFFITH, M. D., Clinical Professor of Diseases of Children of the University of Pennsylvania.

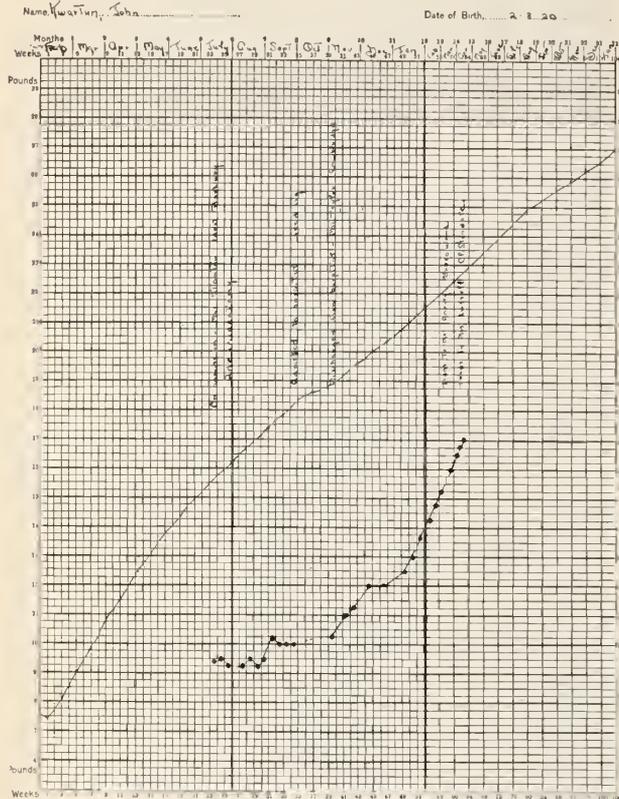


FIG. 7.—J. K., admitted from the Infants' Hospital, and Eye and Ear Infirmary as a difficult feeding case. The solution to the feeding problem was found after four weeks of hospital care, after which the baby made rapid and uninterrupted progress in his weight development.

supervision and training of all their children under the age of three. The assistant physician keeps the director particularly informed of the progress of all problem cases and children who are in any way below par. When conditions press more responsibility upon the foster mother than her experience justifies the child is ordered to some hospital. So far as possible the children are transferred to the Children's Hospital Department of the Boston Dispensary, where they come under the immediate care of the director. Contagious cases are sent to the special hospitals; older children to other institutions, or wherever they can be most effectively treated. Upon their discharge from the hospital they are again brought to the preventive clinic and examined in the light of their recent illness, and their disposition and subsequent treatment is determined by the director.

The importance of an all time physician cannot be overstated; for no consultant of experience could give the necessary time for the daily routine examinations and treatment. With us, a woman physician, on the whole, fits into the place better than a man, for much of her work is with young girls and young unmarried mothers, whom she is better

INFANT'S WEIGHT CHART.

Revised by J. F. CROZER GIFFITH, M. D., Clinical Professor of Diseases of Children of the University of Pennsylvania.

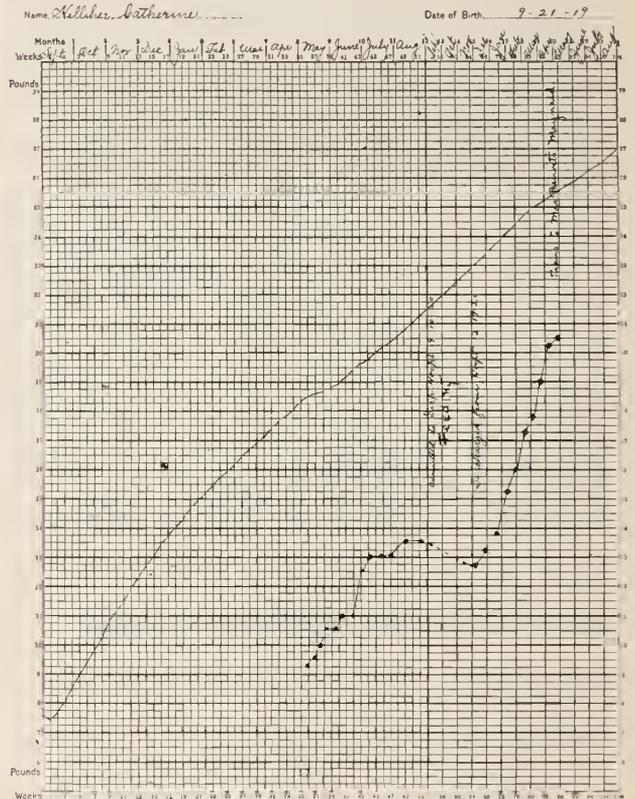


FIG. 8.—C. K., a child from a family with a long and hopeless history. A brother has been in our care for four years. Catherine's development has been considerably more than normal, in spite of a rectal fissure and an attack of bronchopneumonia and furunculosis which required hospital care.

tor recommends that the child be placed by the society in some foster home accessible to the hospital, so that its attendance may be enforced with the minimum of inconvenience to the child and to the central office; for the latter is under obliga-

placed in foster homes at board. This group presents particular problems separate from those of the older children, and to meet them there is a special baby clinic under the immediate supervision of the director. This group requires experience and

curve. Once a week the four nurses meet the director in conference. Each case is carefully reviewed and changes made in food, and the nurse instructed in the principles underlying the changes. They are given directions when next to report.

The foster mothers are always in telephone communication with the nurses. Any unfavorable symptom is reported. The nurse visits the child, gives directions herself to the foster mother if the condition is not serious; otherwise reports the case to the assistant physician, who visits the child. If in her judgment it is necessary, she reports to the director and he either prescribes the treatment or orders the child to be brought to the clinic for his own examination, or arranges for its admission to the hospital. The results of this close supervision are seen in the low mortality rate, and in the almost normal development of the babies, even though bottle-fed. The educational value of such a system of supervision upon the foster mother, the social worker, nurse and doctor, is very valuable and points the way by which large groups of destitute babies may be successfully reared without institutional care with minimum expense and with a comparatively simple organization.

The results of four years' operation of the present method of supervision are shown in Fig. 6. The total number of individual patients carried in the four year period from 1916-1920 was 1,127, representing about 530 cases carried each year. The total number of deaths in four years was twenty-four, or an average of six deaths per year. This represents a mortality of 2.12 per cent. for a yearly average of 282 new patients, or 1.13 per cent. for an average of 530 patients carried each year.

The mortality rate by age is seen in Fig. 7. The figures represent individual cases carried during the four year period, and include all deaths of babies registered as wards of the Boston Children's Aid Society and of the Church Home Society, whether they occurred in the homes or in hospitals. The mortality rate of three per cent. for the first year babies, and 5.7 per cent. for the second year babies represents the total mortality for the four year period. The causes of death bring out the interesting fact that during the four year period there have been only three deaths from gastroenteric disorders and malnutrition, two of which were hopeless when taken by us from an institution—one dying in twenty-four hours and one in seven days. When one considers that there were 459 individual babies in the first two years of life in this period one realizes that the elimination of deaths from gastroenteric disturbances depends upon conditions within our control. These babies were fed upon substitute feeding from the time they came under our care. Not only has the infant mortality in this group been reduced to a point far below what has been considered the minimum for the community but the nutritional development of the child from birth to two years has been considerably above the normal development for their ages as shown in Fig. 8. These latter figures are for the three year period 1916-1919 and exclude cases carried for less than one month.

270 CLARENDON STREET.

INFANTS WEIGHT CHART.

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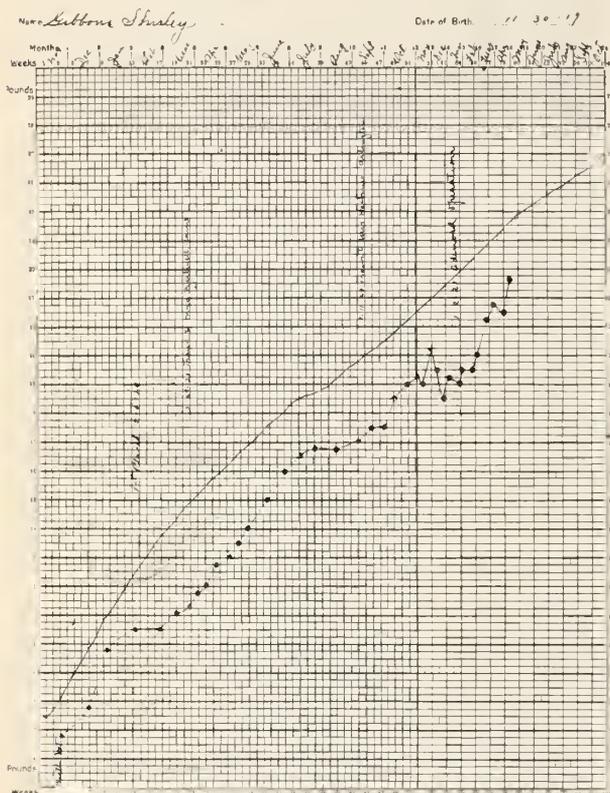


FIG. 11.—S. G. This patient was interesting on account of being an illegitimate child of a tuberculous mother and was nursed three months before we took her. She made one hundred per cent. weight development and so far has escaped tuberculous infection.

judgment in the matter of substitute feeding, for very few of these babies have mothers to nurse them. It is in such a group that the greatest danger lies, and in which the child placing agency without medical guidance is bound to go far astray. However experienced a nurse may be, she needs the direction and supervision of an experienced pediatricist. The difficulties of handling such a group are great. The physical exertion and expense involved in transferring so many babies to a feeding clinic from widely separated foster homes would be very costly. We have organized the preventive clinic for these cases with the idea of getting the maximum supervision with the minimum expense and trouble.

The babies are divided into four groups, each visited by an experienced trained nurse. All babies are examined in the clinic at the time they are accepted by either of the societies. The details of feeding are then carefully formulated and the child is placed in its foster home. The nurse visits each home once a week, or once in two weeks, examines and weighs the baby, goes into details of the hygiene and preparation of the feeding with the foster mother, and makes upon special record blanks notes of the case, and on a weight chart plots the weight

The Nervous Child*

By CHARLES W. BURR, M. D.,
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Dr. Leonard G. Guthrie, in his charmingly written and thought provoking book, *Functional Nervous Disorders in Childhood*, from which I have culled much wisdom and science, divides neurotic children into two great classes: in one, the unrestrained emotional type, the child makes no attempt to control or hide his emotions, in the other, the restrained emotional type, pride compels him to pretend stoicism. In the first class, intellectual power may be, indeed usually is, above the average, but emotionally the child is a bundle of contradictions. The young victim of a despotic nervous organization is imaginative, often superstitious, high spirited but timid, worried by trifles, vain, feels he is unappreciated, craves sympathy, has no idea what discipline means, learns quickly but instantly forgets, works feverishly for a short time and then idles for days, suffers remorse but repeats the offense, is affectionate but his love is purely selfish. As Guthrie says, many of these children eventually become the mainstay of rest houses; a few attain great success in art or literature. Physically they are thin and slimly built. They suffer from night terrors and migraine, and sometimes, but by no means always, are sickly and physically weak, and have poor vasomotor balance, as shown by profuse sweating and cold, damp hands and feet. They, especially the sickly ones, feed the army of the hysterics and neurasthenics in mature life. Insanity often closes the long melodrama.

Children of the second type have strong emotions but try to hide all signs of feeling. They are observant and intelligent, but so reticent they are often thought to be dull, sullen, and obstinate. They are sensitive, shy, and proud. They yearn for affection but are too shy to show it and brood over imaginary slights. They misinterpret the conduct of others and, being suspicious, are unresponsive to friendly overtures. They are solitary, introspective, and have occasional outbursts of furious anger. They have phobias, pass through periods of religious experience and possess no sense of humor. They are prone, at the best, to become incurable sexual neurasthenics, hypochondriacs, mischief making spinsters, or crossgrained and useless old bachelors; at the worst, they become delusional lunatics and may murder supposed persecutors. Few of them attain distinction in any worth while work, though they may in manhood be industrious in a commonplace way.

Many children, of both types, show at some time some physical signs of nervous disease. They are prone to be peevish infants, to have outbursts of infantile anger without physical cause, and at seven to ten years tics (so-called habit spasms) often develop. They are sometimes spasmophiliacs, i. e., the local reaction to percussion of muscles is greatly

above the normal and they are prone to diseases characterized by spasms. Cyclical vomiting is frequent and asthma very common. As soon as they are old enough to be put on a mixed diet, finding food suited to them is a serious problem. Parents think them whimsical and capricious in their likes and dislikes, but the matter is more complex and has deep seated causes. They crave certain articles because of peculiarities in their bodily chemistry, and since all sensory stimuli, those arising from articles of diet quite as much as others, cause in them an associated emotional tone much stronger than in the average child, the color, smell consistency, and general appearance of anything offered them to eat causes much more pleasure or disgust than in the healthy youngster, who cares only for taste and smell. Their esthetic sense and cellular chemistry together cause their gustatory likes and dislikes. They are often stammerers. They are not very subject to St. Vitus's dance, and I am not in agreement with the prevailing medical opinion that the occurrence of this disease is a sign of inherent nervousness in the person affected. It is true that all children during an attack are fretful, peevish, easily frightened, and that sometimes serious mental symptoms appear and become so severe as to end in acute insanity, but the great majority of sufferers from St. Vitus's dance are inherently normal and suffer a mere temporary nervous upset during the acute illness. On recovery from the disease they again become nervously normal. But St. Vitus's dance must never be confounded with tic, which is a sign of a defective nervous heredity and is a somewhat serious warning of future neurotic trouble. My opinion is based upon the fact that very few of the several thousand children who have been treated, many of them for several attacks, at the Orthopedic Hospital and Infirmary for Nervous Diseases, have returned later for any functional nervous or mental trouble, whereas frequently patients, who in mature life come because of hysteria or some other mental disorder, have been treated there in childhood for tic. My experience in private practice has been similar.

Children of both types are victims of an abnormality of personality: their disease is one of personality. They present three problems for study. On what does personality depend? What are the causes of abnormality of personality? What can be done to make the abnormal personality normal? Personality is the thing which differentiates every human being psychologically from all others, which gives him his psychological individuality. It is the sum of his intellectual ability, his moral sense, and his emotions.

He would be a brave man who tried to answer the question, What makes personality? The theological view, that it is something independent of physical organization and is tied up with the soul,

*Read before the Philadelphia Pediatric Society, April 12, 1921.

may be correct, but men of science, as such, cannot study the soul and, as men of science, have no right to an opinion on such a matter because it is outside the domain of knowledge and belongs in the realm of belief. From the point of view of the man of science, personality depends upon the individual peculiarities of the anatomical makeup and physiological working of the human machine. Personality, from the viewpoint of science, is a result of the working and interworking of all the organs and systems of the body. Some systems are more important than others. Of course, the brain is the great organ of thought and feeling, but it can be so hurt by failure of other organs as to be thrown out of gear and made to function abnormally, though every disorder of mental function does not alter personality. For example, if the personality has previously been healthy and has become fixed and crystallized, injury and disease, even of the brain itself, though they cause intellectual defect or disorder, may not change the personality. Purely nutritional disorders, even if they occur during the period in which personality develops, i. e., during infancy and childhood, have little or no deleterious influence. Thus rickets does not, in the slightest degree, cause an abnormality of personality. Indeed rhachitic dwarfs are often blessed with a shrewd, cunning wit. The acute infections of infancy and childhood do not cause the nervous child. When they affect the brain permanently, they cause idiocy or imbecility or that sad condition, aphasia with hemiplegia, usually resulting in mental defect largely from the speech disorder. Acute infantile mania, which I believe to be more frequent than is commonly supposed, also leads to a complete mental breakdown; not an alteration of personality, but its destruction, very early in life. The causes of the condition we are studying lie deeper, and do not result in visible and gross destruction of brain tissue with a corresponding abolition of function, but in perversion of function without a discoverable lesion.

The fundamental factor in the formation of personality is heredity. The immortal stream of protoplasm, which has never ceased to flow since life began, carries with it from generation to generation qualities or rather potentialities, varying in number and complexity with genera, species, and individual families within the species. What happens to any one stream in the human branch of the river of life (any one family) whereby new potentialities arise, whether for evil or for good, we do not know. We do know that characteristics acquired by the individual from without are not carried over, whether they are physical or mental. Thus a man with little natural aptitude for mathematics, who by long training has acquired a great deal of mathematical knowledge, will pass on to his children only the mathematical ability with which he was born. You cannot breed a race of mathematicians by teaching that science to successive generations of ordinary mortals. If a college professor of merely commonplace ability, who has passed his life in the study of pedagogic problems, breeds children and grandchildren who also become college professors, they do not increase in professorial ability as the

generations pass, even if in each generation the organ of thought has been, by practice, trained to its highest professorial efficiency. This is rather fortunate, for the consequences to the world of breeding a race of superprofessors would be rather dreadful to contemplate. The king born with the sneak thief's personality but never becoming a sneak thief, because kings do not need to indulge in petty crime, will probably have a son like himself, unless inheritance is wholly from the mother, no matter what care may have been exercised in choosing the child's environment and in guiding his education.

On the other hand, we know that in an apparently commonplace and ordinary family, there may appear at any time a child whose personality differs, it may be for evil or for good, entirely from its forebears. I am not of course speaking of cases in which parental disease (syphilis) infects the offspring and causes blight, or where accident or injury injures the brain and causes physical disease and hence mental defect, but of cases in which seemingly healthy, but ordinary, parents conceive a child who is a genius or a born criminal, or one of these nervous children we are discussing. There must surely be a physical cause and it may be that, while in each parent each system (brain, bloodvessels, endocrine glands and the rest) is adapted to the others, in the offspring the combination of systems, their interrelation, is bad. I can conceive that a vascular system *a*, in one parent, may be just suited in structure to work well with his adrenal system *b*, while if it is hitched on, by inheritance, to an adrenal system *c*, in itself entirely normal, inherited from the other parent, the result may be bad.

Knowledge, at the moment, seems to indicate that certain of the endocrine glands have much influence on personality and it is becoming fashionable to talk of hyperthyroid and hypothyroid people. Whether fashionable scientific opinion will turn out correct only time will show. Certainly disease of the thyroid may cause mental and emotional symptoms. For example, a boy was bright till his twelfth year. He was easily head of his class, he was fond of play, happy, cheerful and with fair imagination. Then he rapidly became lazy, fell to the foot of the class, ceased to have any imagination, rapidly put on fat and became dull, inert, and, looked at superficially, appeared to be an imbecile. He could not be driven to play, nor roused to any joy of living. When put on thyroid he recovered in six months. He was a hypothyroid. I am inclined to think that some of the nervous children are hyperthyroids. Hypothyroidism deadens rather than perverts personality. It may, however, as one often sees in cretins, increase the feeling of the joy of living, but so far as intellect is concerned it destroys ability; it does not cause perversion of function.

The nervous child, of the first type, may become a poet, even a great one, a musician, even having creative art, and, more rarely, a painter or sculptor. (I suspect that when we learn of the childhood of the sincere and intelligent followers of the newest schools of painting we will find that the percentage of nervous children among them is very large.) He may, in short, become a great artist, but he never can become a great administrator, a great man of

affairs, statesman, general, or leader among business men. He will not become a philosophical man of science, but he may be a religious leader, especially in the ranks of heresy, schism, or false doctrine. When made on a smaller scale he may grow into a sincere Bolshevik, amateur or professional, or an uplifting sociologist. I am quite sure, that many of the men and women who are attempting to save the world today, by trying to destroy it, are examples of untreated, or unwisely or unsuccessfully treated nervousness in childhood. They have all the earmarks.

Let me draw a few illustrations of the nervous child from biographical literature. I can give only fragmentary bits from the lives of distinguished men, because biographers are rarely psychologists, have no interest in the study of behavior as influenced by psychological trends, and regard mere trifles of our external life as vastly more important than things showing the nature of the boy. As a student of human nature, I would rather know whether a small boy was social or asocial, cruel to animals and little children or fond of them, feared the dark or braved all its dangers, lied because of fear of slight punishment, or only when the punishment was sure to be severe, shared the schoolboy's sense of honor or was a hypocritical little prig, walked with shoulders straight or with a slouch, played outdoor games well and with zest or badly and on compulsion, and was graceful or awkward in movement, than to be told the stuff most biographies contain. Still we can learn something from the books. Thus I have discovered only a little about Jonathan Edwards but that little is significant. At ten years he wrote a semihumorous tract on the immateriality of the soul, entered Yale at thirteen and at fourteen was profoundly influenced by Locke's *Essay on Human Understanding*. At seventeen he had a religious experience that satisfied him of his conversion and made him see that the doctrine of the election of some to damnation and of others to salvation was not "a horrible doctrine," but "exceedingly pleasant, bright and sweet." Such certainty about the purpose of God, the universe, and his own infallibility is pathological in a boy no matter what it may indicate in a man.

Lord Byron's mother was passionate and given to shrieking. He was an only child, of violent temper or rather sullenly passionate, but also affectionate. Classmates say of him he was lively, warm-hearted, high spirited, passionate, resentful, venturesome and fearless. Mentally he developed very quickly. He read the *Old Testament* through with pleasure before he was eight years old, but when he came to the *New Testament*, found it a task. People not encumbered with religiosity and remembering their own childhood, will comprehend his reason and sympathize with his attitude. He fell in love at eight and at sixteen, on hearing of the girl's marriage, almost fell into convulsions. He wrote *Hours of Idleness* between his fourteenth and eighteenth years.

John Forster says of Dickens, he was "a sensitive, thoughtful, feeblebodied little boy, with an unusual sort of knowledge and fancy, and with a dangerous kind of wandering intelligence that a

teacher might turn to good or evil, happiness or misery, as he directed it." As a child he was subject to spasms, was never a good little cricket player, nor was he first class at marbles, or peg top.

Friedreich Nietzsche's father was insane. The son was always supersensitive and began to examine his conscience at nine years. He improvised on the piano and studied ballistics at ten years. At fourteen he wrote the history of his childhood and mapped out a vast program of study of geology, botany and astronomy.

Percy B. Shelley, as a child, was very sensitive to pain and subject to paroxysms of passion. Once he even seized a smaller boy and flung him at his persecutor. He was a strange unsocial being and did not care for outdoor play. Once only he walked in his sleep, but day dreamed often throughout childhood and youth. He early became an omnivorous reader.

George Meredith asserted that he had an unhappy childhood but really his parents spoiled him. He feared ghosts and the dark. He did not care to play with other children, was very introspective and "assumed an air of superiority." He never played outdoor games and his companions thought him "a cocky prig." At fifteen years he had a spasm of religion, lasting about six weeks and making him a nuisance to everybody, as he repeatedly asked them if they were sure they were saved. He is the classical example of the boyhood of the prig. One weakness he carried through life; he did not care enough for the memory of his mother to refute the silly stories about his being the natural child of great people.

Did time permit I could multiply indefinitely, from biographical literature, cases of nervous children who became men and women distinguished as novelists, poets, dramatists, painters, and both creative and performing musicians. I could quote from my private records histories of more than a few of the same kind of children who never reached distinction, because in them intellect was not so highly developed that they could do work attracting the attention of the world. My records also agree with biographical literature in proving that the offspring of these people are more prone to be degenerate than are the children of average people. In all, the childhood history is the same; there is a very early and rapid development of mind and the emotions, a total lack of emotional control shown by causeless fits of anger and not infrequently spasms, not epileptic but emotional, sleep walking and sleep talking, delirium with the slightest fever, intense supersensitiveness and extreme selfishness, a lack of the sense of duty towards others, and precocity in the growth of the love feeling long before sexual desire has been established, being indeed asexual. The time of crisis is at puberty. If they pass that successfully, or rather if they fight successfully through the period of adolescence, they may become in spite of their handicap, even brilliantly useful men and women. Otherwise they become useless and, embittered themselves, they make the world bitter to others and if they breed, breed weaklings.

I do not wish you to get the impression from anything that I have said about the nervous child, that

I believe there is a class of children, clearly marked off from all others, children we can put in one pigeonhole, and that I or anyone else can draw a line and say on the one side are gathered all the normal, and, on the other, a special class of the abnormal, the nervous. Such a belief is absolutely incorrect. There are not only no clearcut boundaries between the different types of the diseased but no clearcut line between the healthy and the diseased, the normal and the abnormal. All types of men merge into each other. There are all degrees of health and of disease and pathological qualities are found in queer companionship with health. Every child is, then, a mixture of healthy and unhealthy potentialities and this increases the interest in and the importance of the study of the nervous child, because in planning treatment much will depend upon whether the healthy or the unhealthy potentialities are the stronger. The personality may, because of inherited tendencies, be so warped and twisted that we can do nothing, or the inherent tendency towards health may be strong enough to win out, if the child is wisely managed. The wise physician will guess the riddle rightly: the unwise will rush in with optimism to cure the incurable, or fail properly to handle the curable. One frequent error is to mistake the unbalance many boys have at puberty for degeneracy. It is not. A wise schoolmaster or physician will not be frightened because a boy suddenly says or does something out of consonance with his previous conduct, whether he is a nervous boy or a much to be envied healthy young savage, because he knows that every boy passes through several stages before he comes out a human being. The superficial psychologist of the Freudian school will frighten the parents and, if the boy is left with him long enough, probably injure him unless he is made of very good stuff.

The treatment of the nervous child is important because he is so often the starting point of degeneracy in a family, and, on the other hand, because much of the world's higher work in things above the material, things higher than inventing motor engines and telephones and cotton gins, things more important than those which increase opportunity for soft luxurious living, has been done by people who certainly were nervous children. Too often, because of parental ignorance, they have been neglected and all through childhood have fought their own battles toward health, not only unaided by good environment but held back by bad, whereas they should have been helped in all ways to do the work they were fitted for. The nervous child has so often fought his own battle successfully that one is inclined almost to believe that our efforts in influencing Nature are wholly futile and that what will be, as determined by inheritance, will be, no matter how hard we may try to change the current of development. Would Dickens have done more or better work in manhood had his childhood been passed under theoretically better conditions? I doubt it. Would an environment such as is advised by what calls itself the newest school of pedagogy and sociology (the school of psychoanalysis) have increased his capacity for creative work and his happiness? No.

We can do something, sometimes a great deal, to help the nervous child to find permanent healthy balance. The matter is not one of giving physic. In the dim distant future, when we really know something of biological chemistry, when our chaotic knowledge of those glands now attracting so much attention, becomes much greater and we really know what their functions are, and how performed, we may be able to stabilize the emotional side of children by medication, by giving this or that chemical substance. Today we must use other means.

Nervousness depends upon, in fact it is, emotional instability, lack of inhibition, absence of will, enslavement to impulse. The one object of treatment is to strengthen the will and dethrone the tyrant impulse. This is a hard task at best in a healthy world; today, in a sick world, itself suffering from the very disease we want to cure, the task is harder.

Before entering into the question of treatment, I wish strongly to protest against certain teachings, advanced by people who assert that they have discovered what they call a new psychology, which is largely advertised in newspapers and the popular magazines under the name of psychoanalysis. The literature on the subject is enormous and is growing daily. Starting out as a method of treating hysteria, it now lays claim to being a great system of philosophy, explaining all things. It has expanded into an educational system. The disciples of psychoanalysis say there is a subconscious mind which is the real personality. It reveals itself in dreams. According to them, consciousness exists in utero, and libido begins while the fetus is swimming in the amniotic sac and repressed, unconscious sexual desire causes practically all emotional disease; conscious sexual desire they pay little attention to. A boy's dreams reveal sexual desire, which may have been unconscious since he was an unborn fetus; though unconscious or subconscious it controls him. Treatment consists in having the patient describe his dreams to the psychoanalyst who interprets their symbolism. The symbolism is to say the least peculiar. Any elongated object, an umbrella, a toadstool, a key, water, animals, and a thousand other things are symbolic of the sexual organ or act. The patient is cured by having his unconscious desires explained to him by the interpretation of his dream. This doctrine is being preached by men and women who lay claim to being decent, and who say that we, who know it is indecent, are ourselves dirty minded.

Several writers are clamoring for the introduction of psychoanalysis in the normal schools, social teachers may practise it on their young pupils. Need I tell you what the effect on nervous children such examinations would have? Sexual feeling has much to do with hysterical disorders, but it is not unconscious or subconscious and does not date back to thumb sucking. Another fad is the cure of disorders of personality by surgical operations on the skull for supposititious fractures in infancy, and a third is the cure of badness by removal of adenoids.

Now as to real treatment. It is a matter of education, which is a very different thing from mere school training. First, parents must change their attitude toward life, must get away from the pre-

valent belief that it must be made easy, that luxury is the thing, and must relearn the lesson that inhibition is the one thing children must learn. We must cast aside the false doctrine, that to save a boy you must remove all temptation, prevent all stress, and give him no battle to fight. He must be made strong to fight the battle against evil. We must relearn that innocence, which after all is ignorance, though pretty in a baby is hideous in an adult; that hiding nasty truths does not make them untrue or abolish them, and that work is the one thing worth while. Our public educational system increases the numbers of nervous children because it teaches not truth but falsehood. It teaches that life should be easy, that society must care for everyone. In some schools ranking has been abolished on the ground that it hurts the feeling of the boy who cannot be at the head of the class (really a sensible boy cares naught for such things) and that competition is an evil. More than one pedagogue teaches that children must not be allowed to play with soldiers lest a spirit of militarism develops; others, that history is useless, because, forsooth, what can we learn from Greece and Rome, and the founders of the Republic can teach us nothing because the world, i. e., man, has so changed. Fairy tales, these unwise educators say, must not be told to children lest they aid in the development of imagination, but wise men know imagination is the world's great need. Women, we are told, are the best teachers because they are so gentle, but we know that no boy over ten years old should be taught by women.

Our system of trying to make education universal is fundamentally wrong because it is wasteful to prodigality: many boys and girls are incompetent to take in anything beyond the merest fundamentals, and both public money and their time is wasted by trying to make bookish people of them. Money that should be spent on intellectual boys is wasted

on children whom Nature intended should work only with their hands. To hold them in school does them no good and much harm. They want to work, the years of idleness at school destroy that desire and they become lazy. The one thing to make a boy a man is to teach him selfcontrol, a love of truth, and a desire to work. These are the important, vital things. Our public school system, far from helping the nervous boy, is injuring him, and many boys, just on the borderline, it pushes over.

The parent's part in the training of children and in the prevention of nervousness is of more importance than that of the school. Today parents are in a very unpleasant situation. If they are wise, they may overcome to a greater or less degree the evils of our effeminized public school system, with its superficiality, lack of discipline, multiplicity of useless studies, absence of real and prompt punishment for boyish sins, mixing of sexes and of races; if the father, and especially the mother, are unwise, only Nature can help the child. Fortunately Nature often does help by giving the boy a strong enough healthy tendency to health to overcome the evil potentiality.

I have said little or nothing as to medical and surgical treatment. It can be summed up in a phrase, the nervous child's anatomical apparatus should be kept in good condition and if he has any defect therein, it should be remedied. If he really needs glasses he should be fitted with glasses; circumcision is a wholesome practice in all boys and, if the prepuce is very long or adherent, it is imperative; adenoids should be removed always, tonsils sometimes, teeth should be looked after, but boys should not be tortured for years for the sake of prettiness; noses that fail as organs of respiration should be seen to, but we must not expect miracles by the removal of so-called reflex causes of disease.

1918 SPRUCE STREET.

Psychoses and Potential Psychoses of Childhood*

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True mental disease in children is extremely rare. Hagen (1) stated that it occurred in but one of every 17,752 inhabitants and in more recent times Rhein (2) in addition to five cases in his personal experience was able to collect only forty-four instances from the literature. Melancholia in children was first described by Berkham (3) in 1750 and what is undoubtedly a description of the youngest mental patient on record was a case of insane fury in a nine months old infant, published by Greding (4) in 1790. We should be skeptical about this report. Probably if a pediatricist had been present a more reasonable diagnosis of intestinal colic would have been made.

STATISTICS.

A review of five thousand consecutive hospital admissions brought to light only eighteen instances of undoubted psychoses in children under the age of fifteen. This is less than one half of one per cent. of the admission rate. Ten of the children were girls and eight were boys. The type of mental disease was doubtful in four cases. In ten the final diagnosis was manic depressive psychosis. In seven of these the depressive element was more pronounced and in only one was there frank mania. These statistics do not include postinfectious mental disease, juvenile paresis or psychotic manifestations, or episodes in epileptics, psychoneurotics, constitutional psychopaths, or the mentally defective. However, dementia præcox was carefully searched for

*Read at a meeting of the Philadelphia Pediatric Society at the College of Physicians and Surgeons, April 12, 1921.

and only four examples found. It is likely that this extreme rarity is more than accidental. When one recalls that this disease has its greatest incidence at puberty, or soon thereafter, and that a wealth of endocrine anomalies and disorders have been noted in the fully developed and chronic stages of the psychosis, it would seem that we have a clue too significant to be overlooked in future attempts to uncover hidden etiology.

The age of incidence in the manic depressive group was as follows: one at ten, three at twelve, one at thirteen, and five at fourteen. In dementia præcox the age at onset was eleven and fourteen in the male children and eleven and thirteen in the females.

CASE REPORT.

I have selected one case of dementia præcox for brief description. The patient's heredity was heavily charged. The father had melancholia and a paternal uncle and cousin were mentally sick during the greater part of their lives. The child was bright, in fact, precocious. Coincident with the establishment of the menses at thirteen, she became irritable, seclusive, depressed, and made two dramatically planned attempts to end her life. A brief remission was followed by rapidly progressing and final deep dementia. There were hallucinations of hearing, silliness, vague ideas of reference, delusions of persecution, untidiness, and frequent outbreaks of catatonic excitement, during which she blindly and desperately attempted to injure everyone in her vicinity. At the present time, in the fourteenth year of the disease, at the age of twenty-seven, she is hopelessly demented.

SYMPTOMATOLOGY.

It seems probable that the symptomatology of mental disease is relatively more simple in children than in adults. In the manic depressive group, the depression was often nothing more than an elementary emotional reaction or else it was supported by vague and trivial delusional formation. In only one patient was the idea of personal wrongdoing and selfdepreciation expressed comprehensively and more or less logically. The psychomotor activity was seemingly more motor than psychic and the distractibility and flight of ideas were apparently very closely related to the contents of the environment. Mental confusion occurred frequently. In dementia præcox delusions were usually of uncomplicated construction.

It must be borne in mind that the central nervous system, particularly in respect to its more complex differentiation, is the final acquisition of the child. A structure or organ which has not reached its maximum growth is unable to respond by complete functional expression to either physiological stimulation or pathological irritation. Among primitive races mental disease, especially dementia præcox, is uniformly simple in its clinical expression. For instance, among the Javanese, Kraepelin (5) found a preliminary period of confused excitement which rapidly passed into a silly dementia. Catatonia was infrequent; hallucinations rare; delusional formation very elementary and prodromal depression absent.

MENTAL SYMPTOMS IN DISEASES OF CHILDHOOD.

Of particular importance to pediatricists are the mental symptoms which occur in the course of, or as sequels to the infectious and contagious diseases of childhood. They are very frequent. Alexander (6) states that between ten per cent. and thirty per cent. of psychoses in children are due to acute diseases, especially the exanthemata. Spitzka (7) found that seven per cent. followed fevers; mental episodes have been reported after scarlet fever, diphtheria, whooping cough, typhoid, and malaria. During the course of the acute illness we may expect a varying grade of delirium and subsequently an unmotivated excitement or depression with considerable confusion, often without hallucinations and delusions. Of recent interest are the psychoses which follow epidemic encephalitis in children (8). The clinical picture is more or less uniform. There are impulsive, purposeless motor acts, marked irritability, attention disorders, distractibility, an inconsistent, variable, and unstable emotional reaction, marked insomnia, and occasionally intense eroticism and precocious sexual feelings.

It seems likely that the frequency of mental disorders in the common diseases of children is another expression of the structural and functional incompleteness of the central nervous system. In other words, the resistance which later will be highly developed, is still in an unstable and formative stage.

POTENTIAL PSYCHOSES.

To judge from the case histories of adults with mental disease, there is often in childhood a predisposition which is expressed in terms of abnormal makeup. How may these potential psychoses be recognized? In children who are brought to the clinic we not uncommonly meet the shut-in type of personality. These children, as Dr. Burr once aptly wrote, are a curious combination of child and adult. Intellectually they are often precocious. Socially they are not boisterous, vivacious, or openly inquisitive, but show a passive resistance to their environment. They do not enjoy play with other children, are much alone, and do not readily confide their thoughts to others, even to their parents. They are unduly sensitive and often absentminded and dreamy. On such a basis may develop distinct seclusiveness and a gradual withdrawal from practically all human contacts. This is essentially dementia præcox, the preeminent psychosis of adolescence.

While a manic depressive temperament often exists in the adult, it is less clearly recognized in early life. A certain percentage of children show an undue amount of emotional instability often with pronounced moodiness and sulkiness. I have under observation several intellectually supernormal boys who present almost constant and uncontrollable motor restlessness, which if accompanied by corresponding mental hyperactivity would be equivalent to true mania.

MENTAL HYGIENE.

The pediatricist has the unusual opportunity of studying and sometimes controlling the environmental factors of childhood. While to some extent

the child is limited by its heredity, it is undoubtedly true that much of the future is determined by early influences and training. Without attempting to discuss preadolescent psychology, it might be worth while to point out certain elementary facts. It is probably true that in the early years of life there is an effort on the part of the child to dominate its immediate surroundings. When the path of least resistance is followed by the parents the outcome is a spoiled child. When the opposite extreme method is used, and there is constant severity and harshness, we may expect a repressed child with a crushed spirit, either vindictive or lacking in initiative and courage. What is needed is a reasonable, middle of the road course.

Most normal children are animated interrogation marks. Their curiosity, and especially their sexual curiosity, needs to be taken seriously and generally frankly. If denied by the parents or physicians, the desired information will soon be supplied by questionable sources which may prove highly dangerous.

Punishment of children is a much mooted question. It is generally conceded that it is harmful to the child, if it occasions a marked loss of reasonable emotional control in the parent or individual who administers the punishment. Usually it is possible

to build up more logical barriers against bad behaviour. Children are individuals and have their own point of view and the adult conception may be totally inexplicable and seemingly inadequate to the youthful mind.

Finally no two children are alike. There are personal differences and peculiarities which must be carefully studied. Certain traits need to be encouraged and others discouraged, if the child is to reach the apex of its inherited and developmental possibilities.

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The Problems of Personality in Disease*

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In order to have an understanding of the mental aspects in any given case, we must first have a clear conception of the personality makeup of the patient, and so it is pertinent to ask, What do we mean by personality? It is not my intention to give a long didactic definition of the concept of personality, for it would be confusing. Paton, in his discussion of personality, states it well when he says: "The personality expresses the individual's biological capacity for adaptation, and in a certain sense measures the degree of adaptation of which he is capable at all the different levels of living, reflex, autonomic, and voluntary."

In our consideration of personality this concept must be borne in mind, that the kind of integration with which we are dealing is not inherited, but is acquired in the course of the life time of the individual; hence it is possible, arbitrarily, to divide the growth of the personality into various stages, and for the sake of convenience we may designate the first stage as the intrauterine, the second as the infantile, the third as the preadolescent, the fourth as the adolescent, and so on through the life span of any given individual.

Thus it will be seen that as the individual progresses through each period of his development, his experiences involve a more and more complex organization of the nervous system. Concurrent with this growth, we find larger and larger association

areas becoming involved. Therefore, in the consideration of the personality of any individual, we must bear in mind the necessity of obtaining a concept which contains a longitudinal section of the individual's life rather than accepting as sufficient data that which we can obtain by taking a cursory cross section observation. That is to say, it is always essential that we study the past, for we react to the present in a manner which is largely determined by our past experiences.

In order to arrive at a satisfactory understanding of the elements which may have exerted some influence in the shaping and growth of the personality we must inquire into the possible factors which may mold the growing personality. Our first consideration then, most naturally, would be those factors which fall under the category of hereditary influences. These factors, as such, have long been recognized in their potency, and in the present consideration we shall confine ourselves to the discussion of patients who receive an essentially normal hereditary endowment. Second in our consideration are the influences of the environment. The scope of these broaden as the individual gains growth and experience. Included in these, we must recognize those influences exerted by the home surroundings, the schools, the neighborhood, and those produced by the broader social setting as the individual expands his interest and activities.

In the early periods of development of the personality the home stands out preeminently as the

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most important factor. In this consideration we not only must look at the home setting as such, but recognize the various potent factors which may contribute to faulty adjustments on the part of this growing personality in the home. In this field alone the nurse can make a monumental contribution to the health of the home, if she, in her capacity as guardian of the sick, can instruct the mother and father of the child how to meet certain simple everyday problems in a healthy, objective, unemotional manner.

Among the most potent early influences we must recognize the importance of the commonplace events of everyday life, such as the apparently simple problems of nutrition, of sleep, of habits of cleanliness, the ability to accept certain restrictions placed upon them, and the ability to acquire independence. From personal experiences one will be able to see the power for good or evil contained in the possible reactions of the child to these apparently commonplace events and will recognize that they contain elements by which the child builds his progressive steps towards habit formation and behavior manifestations. In other words, the way the child responds to these simple environmental situations predetermines, to a large degree, his future ability or inability successfully to function as an adult.

For example, if the child finds that through the manifestation of fear and sleeplessness when confronted by the dark he can gain the attention of the parent, possibly force the parent to sit by his bed, or lie down beside him, or leave the light burning, he will soon accept this as the most successful way of putting himself across; in other words, he gains attention where otherwise he would not. The same principle can be found in the various reactions to food, his refusal of certain articles, his insistent demand for others. A frequent example of this is the demand for coffee or tea, often a mere transition or continuation of his infantile habit fostered by the mother through her habitual giving of the breast each time he cried.

It is only a step further in this process of maladaptation that one finds the beginning evidences of somatic or physical complaints. We are all familiar with the child who complains that if he is made to eat certain foods he will be "sick at the stomach" and if perchance the parent persists in forcing the ingestion of this undesired food, he soon finds that vomiting of the disliked food becomes the most efficient protest against a repetition in the future. It is evident, then, that even in childhood we may get certain physical symptoms or manifestations as a direct response to certain psychic attitudes. That is to say, if the child finds that he can dominate the situation through somatic complaints, or definite physical symptoms, in this manner avoiding the necessity of making undesired adjustments, he is laying a foundation for future responses, and under the stress of difficult adult problems, he may refuse, or be incapable of facing, responsibilities and may develop an obscure invalidism.

A case in point is that of an eleven year old girl who came to the clinic with a complaint that for the past two years she had been nervous and that each morning she was troubled with an intestinal upset

and vomiting which often made her so weak she could not go to school. The child was evidently dependent upon her mother, cried when asked to enter the examining room, and clung to the mother's hand during the interview. The father was dead; the mother, the patient, and a brother fourteen years of age, lived in a small apartment, the mother earning a livelihood as janitress and washerwoman.

The early history was negative, except that the child was nursed until she was sixteen months old. She had always received a good deal of attention from the mother who was oversolicitous and extravagant in the affection which she showered upon the child; this tendency could be explained on the basis that the lonely woman found, through the medium of her children, a source of emotional satisfaction.

The present nervousness was reported to have begun as a result of fright two and one half years ago, when, while playing in the park, she saw a cousin fall into the pond. The patient cried hysterically for hours, and her present symptoms, nervousness, sleeplessness, nausea and vomiting, gradually developed.

On questioning, it was found that the child had always slept with her mother. She habitually remained up until the mother retired, because she was frightened of the dark. The mother was unwilling to allow the child out of her sight, always accompanying her to school. When the child vomited, the mother became much upset, was very solicitous and more attentive. The child talked freely of her past experiences, of her love for her mother, etc. It was felt that the present symptom complex was largely the result of an unconscious infantile wish to remain with her mother, and because of this, the first step in treatment should be along lines which would tend to free the child from this fixation. The first point of attack naturally would be to assist the mother to gain a new point of view.

This approach met with success. The mother was persuaded to allow the child to sleep in a room alone, to allow her to go to school unattended, to furnish her with certain responsibilities about the house, and above all to help the child become emancipated from her state of infantile dependence. She returned in a week much improved, had had only one attack of diarrhea, was feeling much better, less nervous, and had attended school each day. Four subsequent visits were made, each time with continued improvement, and gradual loss of all symptoms; she had become more selfreliant and independent, to all intents and purposes. She is now enjoying good health.

This case illustrates very well the ease with which a child may become habituated to certain psychopathological means of adaptation and demonstrates the necessity of obtaining a comprehensive understanding of the life of the patient in all its aspects, but especially those presented in the home surroundings. The lesson to be gained from it is even more forceful when we recall that this child had been receiving medical treatment as such, for her physical complaints for a period of over two years.

The frequent occurrence of just such cases in the everyday experience of the nurse leads one to ap-

precipitate the opportunity presented to the nurse in her intimate contacts in the home to assist very materially in the education of the parents and through her insight furnish a powerful means of forestalling these beginning manifestations of maladjustment.

The principle here illustrated is becoming more and more recognized and even in literature it is possible to find concrete examples. In a recently published life of Margaret Fuller, we find existing between the father and daughter a pathological attachment which wrought indelible change, affecting her general attitude throughout Margaret's life. As a result of this profound attachment, we discover evidences of precocious stirrings of sex interests and desires: concurrent with these desires come the conflicting emotions and the attempt on the part of the girl to repress these unacceptable thoughts. It would seem that for some years she was able to do this fairly successfully but when in her twenties, the family removed to a remote farm district where opportunities for companionship were confined to her father, she was able to sustain the emotional conflict for two years and then fell desperately ill, so that even her life was despaired of. This case illustrates very well the tendency on the part of certain individuals to find expression for the emotional conflicts through a displacement of the destructive forces at work to the physical levels. It is in just such cases that nurses may, with a broader understanding of psychological principles, be able to help materially in constructing a healthier mental attitude in these patients, and by so doing free them from the bonds of invalidism.

The third great factor is the influence of organic and functional inferiorities on the personality. Alfred Adler first emphasized the importance of organic inferiorities as the cause of distressing compensatory strivings. We perceive must recognize that inferiorities of an organ or function become emphasized when they tend to cause failure in the competition of everyday life; repetitions of this failure tend to create a fear of failure. The task then is to find a means of adequate compensation.

This is frequently displayed on the physiological level, for it is a common occurrence to find a hypertrophied left ventricle in mitral insufficiency, the enlargement of the remaining kidney when the other is removed or destroyed through disease processes, or the enlargement of the thyroid when the pituitary gland underfunctions, etc.

If such compensation occurs on the physiological level, is it not easy to conceive this process as occurring in the higher psychic levels? As a matter of fact this is just what does occur. In the competition of everyday life, we find certain individuals with recognized inferiorities; it is the fear of their organic or functional inferiority that forces them to make compensation. This is most often true of the functional inferiority which manifests itself in a struggle for heterosexual virility.

Where there exists a condition of sexual inferiority as measured by the sex standards of their associates, such as we find in the effeminate man or the woman with marked masculine attributes, or in those individuals with functional inferiority due to

perverse sexual tendencies or autoerotic cravings, there is prone to exist a "pernicious sense of inferiority from which they are forced to protect themselves in some manner." When we consider the various means an individual may use in seeking to protect himself we find that they may for the sake of convenience be divided into three groups.

First. He may seek protection through avoiding competition. By so doing he need not expose himself to the task of measuring up to the standards of his rivals. But this solution contains within it elements of destruction to the personality, for he may soon find that it is necessary to withdraw from all personal contacts in order to avoid the stressing of his own inferiorities. Through this habitual withdrawal from competitive reality, we find the gradual development of a shut-in personality, with his seclusive suspicious, self-loving tendencies. In other words, there occurs a retrogression toward the deteriorating psychoses. Examples of the end products of this type of defense are numerous in the hospitals for mental diseases.

Second. He may seek for an elimination of this inferiority either through a psychic castration (by this I mean refusal to admit the presence of the offending part), or, as occurs very often, he may seek elimination through actual surgical excision. This type of reaction might be conceived by many as being socially acceptable, for has not the subject of surgical operations become the popular topic of discussion at pink teas and social functions of all kinds?

Not long ago, in discussion with an eminent physician, the statement was made that at least sixty per cent. of the surgical operations were performed in cases where the symptom complex, while apparently due to physical causes, was in truth due to the unconscious affective cravings of the patient. If we accept this as the existing state of affairs, it is easy to see why nurses and physicians should have a thorough understanding of these mechanisms in order that they may better understand the true condition of the patient. It is a common occurrence for patients to return after a surgical operation complaining that only temporary relief was gained and that now they are worse than ever. How can we expect cure when the root of the trouble lies in the maladaptations of the individual in his emotional life? A case which illustrates this point is that of a girl of thirty-two, well educated and holding a responsible position. Two and one half years ago she began to complain of extreme discomfort after eating and showed all the cardinal symptoms of a gastric ulcer. She was cared for by one of the best internists who treated her for gastric ulcer according to all the modern methods of medical treatment, including the use of the duodenal tube for two months. Little improvement resulted and finally he advised a change of scene, restricted exercise, a special diet, etc. A year and a half later she came to me complaining of excessive distress and nausea, gastric pains, and loss of weight. An examination showed extreme tenderness and rigidity over the pylorus. The history of the girl showed many evidences of a neurotic makeup, with an extreme fixation on her father, severe conflicts about certain

friendships, and a recent disappointment due to the unhappy ending of a love affair; in other words, there were evidences of profound affective cravings which were essentially unfulfilled.

I placed her in the care of an eminent surgeon for observation. His first impression as the result of a brief examination led him to believe that surgical intervention might be needed, but careful study for ten days in a hospital, with the use of all the modern methods of diagnosis, failed to reveal the presence of any pathological condition. The stomach contents were normal, digestive functions were normal, the x ray showed no retention, thickening, or any findings suggestive of trouble. Through psychoanalysis, she gained much selfknowledge and as a result of this was able to reconstruct her attitude towards life, so that she accepted a more objective viewpoint regarding the painful repressions, etc., and became finally a well integrated individual. Concurrent with the unfoldings of this selfknowledge, the gastric symptoms disappeared, and she now eats anything she likes and feels like an altogether different person.

We all can learn through illustrative cases of this sort that surgical procedures may not furnish the medium of cure in all cases. Frequent reports of such cases are made. Dr. Jelliffe in his publications reports the case of a man with a sex inferiority which was much overcompensated giving rise to affective tensions resulting in the production of a duodenal ulcer.

This naturally leads me to the consideration of the third type of defence, that of compensation. This is by and large the most frequent and most often successful. By the development of a protective superiority in some other function, the individual is able to gain satisfactory social recognition; if, however, we deprive this individual of his means of compensation by forcing him into a vocation he dislikes, or by preventing him from giving up work that deprives him of a means of solving his affective craving, we drive him back to the realization of his inferiority and then he is prone to become "a patient complaining of distressing cardiac, respiratory, gastric, intestinal or genitourinary symptoms, resulting from an unbalanced and pathological tension of certain autonomic segments."

As Kempf so well states: "These tensions are conducive to unbalancing the reciprocal relations of the segments of the (vegetative) or autonomic system and, by their causing a stream of distressing sensations, force the individual to make a social adjustment. For example, when an artisan loses his right hand in an accident and complains of insomnia, loss of appetite, a sinking feeling in his abdomen, we know that the stomach and viscera in the epigastric region have assumed postural tensions that are the source of a stream of fearful feelings, as he compensates by developing efficient skill with his left hand the dangers of failure and poverty decrease, and the troublesome tensions are relieved. Thus it will be seen if the individual finds a successful means of compensation, he makes a successful adjustment, but when for any reason his means for compensation of his inferiority are removed, he is driven back upon himself, and as a

result of the autonomic tensions set up, he will display a variety of symptoms which we know as physical."

This holds true throughout life. It is a common occurrence to have a child complain of headache when it is time to go to school in the morning, and when nine o'clock has passed the symptoms may gradually disappear into thin air. If, however, one will investigate, it will frequently be discovered that a written test was due which the child feared, or a competitive drill of some sort was scheduled which would force the child to measure himself in competition with others, with the fearful possibility of finding that he would fail to measure up or be unable to put himself across according to the standards of his classmates. If perchance he should, through painful past experiences, have known the dissatisfaction of defeat, the situation is aggravated. Thus it will be seen that the somatic symptom complex has as its basis this driving fear of failure; failure, with its consequent insult to the ego, which, for the comfort of the individual, must be protected.

To give medicine for the distressing symptoms of headache or nausea will not eliminate the basis of trouble. What the child really needs is help in facing difficult situations and in order that he may be better able to do this, we must help him to gain a better mental attitude by teaching him to recognize his assets and his limitations, to accept them as such and to make the most of the equipment which he already has, by finding successful means of adaptation to the realities of life as he finds them.

I have attempted to suggest to you in this brief presentation some of the possible factors which tend to contribute to the shaping of the growth of personality; first, the influences which are exerted from the conception of the individual as a unit, the possible influence of heredity; secondly, the influences of environment in all its aspects, through the medium of the home surroundings, the school, the neighborhood, and the broader community influences met with as the individual expands his social interest and activities. Thirdly, I have presented briefly those factors rising from within the individual himself which tend to bring about changes or adjustments in the personality makeup as such, first through the avoidance of the stress of competition through fear of failure in the measuring of himself with the standards of his associates, secondly, through the refusal of recognition of the offending difficulties or through the attempt to rid himself of the offending inferiority through actual surgical intervention, and lastly, through an attempt to solve his difficulties by compensating for the inferiority through the development of an acceptable superiority.

It is my desire to assist you to gain a viewpoint which will enable you to appreciate the fact that through this psychological approach, you have a definite approach to the physical; that it is never possible to dissociate absolutely the mental and physical elements in any given case; that this interrelation of mental and physical must be accepted, and in order that we may gain a satisfactory understanding of it, a knowledge of the psychological elements at work in each human problem is required.

Personality in the Making

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We all have a warmly personal feeling of self which is the mainspring of all our actions, thoughts and emotions. This is the ego. The ego finds its expression primarily through the exercise of our instincts which represent within us the heritage of human as well as of all other life since the beginning of time. We have long recognized that life centres about the operation of two all important instincts—that of selfpreservation and that of procreation. The first seeks the welfare of the individual, the second that of posterity. The instinct of selfpreservation, with its many collateral, supplementary and dependent instincts to reinforce it, and that of procreation, with which are combined innumerable other instincts whose manifestations can either be raised to the highest ideational spheres or be dragged to the depths of grossest animalism, exist in different relative combination and strength within each one of us. The ego is the resultant expression of this distinctly individual complex. To these primary evidences are added those secondary ones which result from the ego's struggles to preserve its identity in the face of the ceaseless onslaughts of the external forces in life. Those expressions of ego resulting from the instinct complex are thus due to heredity; those modifications in the assertions of the ego which result from the struggle for acceptance are due to environment. The life of each of us is a series of efforts to reshape the ego of heredity into forms acceptable to the world of environment. This is indeed a life task, for the original ego is exceedingly tenacious and active in its own behalf to preserve contact with the world outside free from all restraint. To accomplish this end, it will surround itself with an astonishing array of disguises, tricks and other devices intended to deceive the self and the world about.

From this we may infer that the ego labors. First of all, from its earliest beginnings the ego, through its instinct complex, strives for conscious recognition of its existence by the individual. During the early stages the baby is an almost unconscious, plastic medium. Through the very fact of this struggle for conscious recognition, we recognize that by far the greater part of the ego always exists in the unconscious part of each person's psychic life. It is the initial state out of which all forms of the ego must emerge. Such forms of the ego as do finally receive conscious recognition must then be still further modified and curtailed before the prudent individual allows them to meet the eyes of outsiders. In fact, only a small portion of the conscious ego is ever permitted an external life.

For purposes of convenience, let us consider unconscious and inner (that is, outwardly unobserved) conscious life as subjective phases of the psyche, while all evidences of consciousness, whether originally conscious or unconscious, which take form in an external object, we shall consider as objective

phases of the psyche. We shall find that it is the constant aim of the ego to externalize its identity, preferably by way of the inner subjective consciousness into which it has gained admission, or directly from the unconscious into the external if the resistance to even the briefest flight through inner consciousness is too great. The latter is usually resorted to only when immediate external action is needed to meet an emergency through a powerful assertion of the ego in the interest of selfpreservation or when pathological mental conditions exist.

It will have become clear from this conception that the ego struggles against certain restraints which threaten its free expression. Such restraints do definitely exist. They are most easily thwarted in youth, but become more definite and closely interlocked as we grow older. On the one hand they form the basis for mental health, selfpoise, personality; on the other, lack of these restraints explains all the varied and heavily disguised forms of psychic abnormality encountered in such profusion throughout the human family.

These restraints arise from two sources: one of them external to the individual, the other internal. At times they work together; again they will work independently; and not infrequently they will work violently against each other. We are here particularly interested in the psychic restraints.

Let it be emphasized here for purposes which shall become clear in later writings that it is in youth that the barriers between unconscious, inner and outer life are simplest, and that, therefore, the strivings of an active and turbulent ego for objective life are easiest of attainment. It is during these earliest years that the ego wins repeated epochal victories over all psychic resistance—victories which stand out as fixed points in the individual's evolution and from each of which will radiate new lines of conduct which will determine the whole future course of existence in health and in sickness—be this physical, mental or emotional.

What, then, are these psychic restraints, and wherefore the need of struggle?

Who is there who has not at some time felt that he is of better and finer clay than that common to general mankind? This feeling is normally felt most frequently in childhood and early youth, but even through maturer years it is likely to crop out at strange and unexpected moments. Ordinarily, however, as we grow older and realize our shortcomings, as we compare our individual attainments with the even better attainments of others, as our mental horizon broadens through contact with our fellowmen we seek to repress this feeling of smug superiority and strive to content ourselves with a more modest estimate of self. We laboriously train ourselves through systematic and cumulative intellectual discipline to accept the abstraction of reason that we are truly but a single and unimportant phase in the human cosmos of the ages. But we far from

accept this verdict of intellect in our emotional appraisal of self. Here, under many disguises, we continue unto death to believe firmly that we are of the elect in the human family.

That this feeling is normal is evidenced by the fact that we all confess it at some time in our lives. Selfdiscipline, especially when accentuated through fear of ridicule by others, may lead us to hide this feeling completely from the world. But it is only hidden, buried in the deepest recesses of inner consciousness. Even here it is not long permitted to parade in its nakedness before our mental vision, but is pilloried, clothed, and then put to useful work.

The suppression, disguises and work to which we subject this irrepressible feeling leads to many strange variations in the normal life of mind and emotions, and produces within each individual an outward guise or pose which we sometimes call personality. Commonly we associate the idea of personality, not with the neutral aura of average persons, but rather with the striking individuality of persons of distinctly greater intellectual or other attainments than common, or even with mentally peculiar, erratic, abnormal or deranged beings. Nevertheless, the same processes which bring out striking personalities underlie the life of those of us who are average. Everyone possesses personality, but, as we shall learn later, most of us definitely prefer to be average and to regulate our lives in accord with that aim. Average personality, transplanted into strange countries or into other times, would clearly appear to be anything but average to the regular people of those countries or times. They would be like pictures taken from their conventional frames and placed into strange or incongruous settings.

Let us recall the statement that the feeling of a superior quality of our personal clay is felt in its purest form in childhood and early youth. After these early years the feeling is more and more suppressed and mutilated through the conflicts with the ego.

Human society has always realized the existence of conflict between the ego and the world outside, although it cannot be said to have realized this condition in an analytical sense. It has at all times definitely striven through teaching to conciliate the individual and the social group for their mutual advantage. Where it cannot conciliate, society firmly restrains excessive egoistical tendencies. Even in the simplest social organizations a definite course of initiation into family and tribal customs was prescribed for its youth. The individual was taught through religious ceremonies, folklore, ceremonials of tribal organization, customs in hunting, in the use of weapons in warfare, etc., just how to conduct himself, not merely to meet the various demands and exigencies of life for his own protection and advantage, but to meet them according to acceptable standards of conduct. We realize today that even the most obscure religious and other rite ceremonials of ancient peoples originally had basically no other object than to teach youth the acceptable use of its instincts of selfpreservation and of procreation—acceptable to the standard requirements of that social group and time. In

the civilized communities of today we have an even more complete and thorough, though considerably less obvious and direct, education for our youth, calling into service the facilities of family life, a complicated social order and a paternal government.

Thus the first steps in the rules of life are gradually unfolded to each child through some form of systematic external education and restraint. These rules form but a framework for conduct, it is true, but this framework represents a good model. It epitomizes human effort through all stages of its evolution. With this model as a guide, each individual may construct the framework of his life over which he may then cast the mantle of his own personality which shall be woven out of the varied material brought together by his ego.

While external education may proceed according to plan, the individual must begin an adjustment in his inner consciousness practically immediately on the heels of the ego's first defeats which have followed its turbulent stormings into consciousness and the instant conflict with environment which an overflow of this unrestrained ego precipitated. From infancy he is made to understand that his ego and the environment clash in almost constant conflict and that the outside world has an advantage in resources and authority which cannot be gainsaid. Thus the conclusion is forced upon him that, to reduce conflict with environment to a minimum, some definite control to hold the assertive ego in leash must be devised.

The normal healthy ego must of necessity develop into a fighter in order to establish its identity objectively; but it must learn to fight according to certain rules which are sanctioned by the outside world, otherwise it must suffer the penalty of ostracism. Then, like every accredited fighter, it will thrive through training, abstinence and struggle. Not only must it fight according to the rules, but must set before itself a goal, an ideal, which shall be an embodiment of the spirit behind the letter and shall through its distinctive merit give the owner an honorable rating before his audience. Of this the ego is incapable without the aid of definite grooming and control from forces within the realm of subjective consciousness. As this ideal which shall control the ego must make its influence felt before the ego emerges from either the unconscious or the inner conscious phase of the psyche, the latter casts about for a suitable subject within its own domain which shall be enthroned with sufficient power to enforce its dictates.

The realization by the self of this necessity for inner control strengthens the newborn knowledge of the limitations of self which contact of the infant with the outside world has engendered, especially as these conflicts of ego with environment rapidly rise from the level of sensation to those of simple ideation. It affords him the first feeble recognition that he is of other substance than that all about him. The more conflicts he witnesses and the more experience he gains, the stronger and more clearly defined becomes this feeling of separateness, of aloofness, until an exaltation of the feeling of self results. This, as a purely emotional phenomenon, produces a conception of personal separateness from

all things external—the rest of the human family included—and leads from what at first appeared to be only a physical and quantitative difference of individuality to a qualitative one. The emotional exaltation then takes the form of an individual estimate of superiority.

This essentially personal feeling, then, is selected by the psyche to enact, after careful transformation, the rôle of ideal. Through censoring all expressions of the ego which pass in review before it before being allowed out of its control, this ideal shall pass upon or reject what is offered. Its difficult rôle shall be to change the primary ego of heredity into an acceptable secondary ego which shall exist on terms of harmony and cooperation with the environment for the peace and happiness of the individual and of his fellowmen.

The point will here be raised that this peculiar feeling is but a phase of the ego, rather than something distinct; but this is only true in another sense. It is true in so far as the ego adopts the dictates of this ideal as a part of its own acts. To revert to the simile of the fighter: he may be powerfully built, possess great endurance and skill, be well equipped with the weapons of combat, and not only be capable of inflicting punishment but be able to accept severe punishment in return without giving up. But it rests with him whether he shall be hailed with acclaim or with abhorrence, should victory fall to him. The verdict of onlookers will be based first of all upon a common understanding of rules according to which he will be expected to fight. They will then apply this standard to his actions, and will judge him well or ill in so far as he has complied with and lived these rules. In themselves, the rules are an abstraction, an ideal. This abstraction exists outside the individual in the general consciousness of a large group. It is the result of preserving the best experience of the ages. Only in so far as each individual translates this outer general consciousness into terms of his own inner consciousness and stamps with his approval the accepted rules as a true measure of his own acts is this ideal a part of himself. In the same manner the inner ideal is an abstraction which has an existence within the ego only in so far as it serves as an influence on its behavior.

Let us now conceive all individual consciousness, when stripped to its simplest terms, to consist of three phases comparable to a house with three peculiarly built rooms. The first of these is like a dark, unexplored and mysterious cave, a cellar, whose far recesses may, for all we know, extend to the very depths of the earth with its fearsome inhabitants. It seethes with a strange life which is hidden from the light of day. Its forms are inchoate, monstrous, or belong to forgotten ages. Above is a large, half lit room, crowded with furniture and strange beings all in kaleidoscopic motion. Not only do the contents of this room change their relative positions, but at short intervals even the contents themselves seem to melt away and to reassemble in other shapes. Then to our surprise we often note on closer scrutiny that many of the contents which apparently disappeared or changed their form in reality only draped themselves in

clever disguises to hide the original shapes beneath. Thus it goes on incessantly, grouping and regrouping, a partial or complete change of furniture and inhabitants, with new groupings and regroupings, transformations whereunder the hideous assume an alluring covering, while the shy, the beautiful, the wistfully hopeful hide under tenaciously clinging disguises of ugliness and horror—always grouping and regrouping. In spite of this life, this change, this evident rivalry and intrigue and upheaval for favored places, all moves silently. The halflight comes through several small windows which give a view outside. And all this grouping and regrouping, all this restless change, all this fighting for position by force or by trick, have these windows and the two doors in this room as their pivotal points. All strive either for vantage positions to reach one in particular of these two doors, or, as next best, to reach the windows to catch fleeting glimpses of the outside before the next change. All frantically avoid proximity to the remaining door, and can be made to near it only when strength fails under the resistless pressure of the moving mass. The third room is light, airy and amply large for its few inmates. Except where joined to the second room, and except for a roof sufficient to cover the floor space, it is open on all sides. We may think of this room as a porch. Out of the connecting door leading from the second room come strange people, mostly in conventional garb, who either loiter contentedly beneath the shelter afforded by the roof or, glad of the freedom from former discipline and confinement, wander from this sheltering roof forever. They join the increasing throng which seems to spring up on every hand from numerous similar little houses about, all bending their steps toward a common meeting place ahead.

Thus let us conceive individual consciousness, and now let us follow further some of the strange details which this picture has visualized for us.

Up out of the dark, underground room (the unconscious) rises a stairway to the door leading into the halflit room above (inner consciousness). Within this upper room all motion (or processes) of perception, imagery, ideation, are normally under definite control. Not only the motions, processes, groupings and regroupings, behavior and transformations of all things within this room, but the door of ingress from the cellar and the door of egress to the porch are under the control of a guardian—the censor. He it is who opens the door a crack in answer to the summons from below, who passes upon the fitness of some new appearance of the importunate ego to enter, or slams the door upon it if judged undesirable. He it is who enforces the rules within that halflit room according to which that house is to be run. Then, too, it is he who jealously guards the door of egress into the open, allowing none to pass that fail to satisfy him as to their worthiness to act as representative products of his training when they reach the outside. Thus it is normally.

Onslaughts from below often disturb the motions above. Intrigues and deceptions above lead to occasional uprisings against restraint, resulting in

fierce struggles for mastery between inmates and guardian. Such diversion of attention or actual inefficiency on the part of the guardian may result in complete momentary or even permanent overthrow of restraint and a bursting open of both doors. Then follows an orgy of lawless upheaval from below, a storming of the room above, and a headlong *melée* which debouches upon the open porch and into the free world outside. The ego in all his most undesirable forms is rampant, and, unless order can be promptly restored, the strange house is ruined and ready to collapse.

Thus we see why it is fitting to consider the unconscious and inner consciousness as subjective phases of the psyche, whereas those phases which have passed beyond the control of the censor and find their existence in the external world are objective expressions of the same. Actions, thoughts, emotions, feelings or other evidences of self which have once passed or escaped the censor and have externalized themselves are beyond the further control or influence of the individual. Only the effect of their entry into the outside world can be observed, and, eventually, valuable experience is gleaned from this observation which will be reflected in the censorship of further releases.

And it is this very evaluation of experience from the unrecalable acts of the self which are of such inestimable value for the future control of the individual. In infancy, when the censor is practically missing or inexperienced, the door from the unconscious into the inner conscious is open and unguarded. The ego stalks through in whatever form he pleases. He needs no disguise. As the need for control becomes evident, censorship asserts itself in unmistakable terms which become increasingly strict. Then we observe that the ego resorts to wiles and deceptions to gain admission. Further, we note that at certain times, which we now recognize as distinct developmental periods, the onslaughts by the ego become more concentrated and powerful in their pressure. The ego assumes forms with which the censor is so unfamiliar that he is frequently misled into admitting them upstairs without proper credentials for their object or behavior. Only experience will make him more wary for the future. At times the struggles between some new phase of the ego, as it emerges from the unknown, and the censor are so severe that both suffer cruelly from wounds that leave lasting deformities and scars. This battered form of the ego becomes stultified, fixed, and will remain for years hidden in some recess of the cellar or of the upper room, suppressed or forgotten. Then unexpectedly it escapes control when the censor has his attention diverted or is worn with the struggles on every hand. The deformity becomes the source of evil contamination for all the other forms of our mental life. This mutilated form serves as the actual basis of some deepseated neurosis.

As with the doorway between subjective phases of consciousness, so, too, with the doorway leading from inner to outer consciousness. In infancy it is wide open at first. The ego, whose constant aim it is to emerge from the unconscious into objective expression, passes through both doors of the

upper room as if borne on the wings of a draft. Externalization is quickly accomplished. Quick demoralization and death must follow unless at least the outer door is speedily closed.

Let us now look more closely into the evolution or transformation of the superior clay feeling for identity—a transformation which must take place before the rôle of guardian or censor can be effectively established. We wish to discover how, as a psychic phenomenon, censorship is enthroned and develops an existence distinct from the ego it is to control.

Very evidently this transformation results from the interaction of forces exerted both from within the individual and from the world outside. As the feeling of selfappraisement gradually develops it is accompanied by feeble experiments whereby simple modifications of the primary ego are thrust outside for the purpose of checking up the conception of separate entity. Accumulating sense perceptions serve as the basis for simple ideation. Ideation, in turn, serves as the means of orientation as to which of these simple modifications are acceptable outside and which must in future be suppressed. Outside censorship having promptly made its presence known, it becomes clear that future experiments will prove disastrous unless the restrictions and the demands upon the externalized ego are understood. Otherwise the feeling of self becomes so confused in the din of strife between ego and environment that ideation and rationality cannot develop (as we observe in cases of feeble-mindedness, idiocy, and other abnormal states).

As a matter of fact, the outside world soon assumes the initiative in making known its rules, not waiting for ego experiments to make their appearance. A very comprehensive system of information about and enforcement of its schedule of restraints and rules is made known to the individual according to which his censor shall in future be guided before the ego emerges. As indicated in another place, this system or code for conduct is presented in the shape of formal instruction undertaken by various agencies of the social group in which each lives. As we observe how social standards have emerged from their simplest forms to the higher ones of the present day, we note how experience as it has confronted countless individuals in various life situations has been absorbed within a general consciousness common to the entire social group. The lessons of this experience are so preserved as to make it possible to easily teach them to each rising generation.

We may thus conceive that the outside world has developed, first, a social conscience which is a composite conception derived from experiences and observations demonstrating that, whatever line of human endeavor may be under consideration, success for the group depends upon holding the individual to strict adherence to a correct and high level of action. This level is what we may call the group's idealization of its composite self for which it will strive in terms of accomplishment and morality for the common good and in its relations with other social groups. Then we may conceive further that this idealization for the group will pre-

scribe certain standards in accordance with which the actions of each individual member shall be measured. In other words, his degree of conformity or nonconformity to the rules of the group ideal will be tested under a censorship. This censorship we recognize under the name of public opinion.

Group experiences upon which rules are founded fall under different headings which correspond to the principal types of human activity. Therefore, the teaching of these rules for individual conduct likewise falls under subject heads corresponding to group experiences which involve either social organization or control or evolution, etc., or religion, intellectuality, business efficiency, etc. Thus the individual is coached in the rules of community life, of political government, of business cooperation, etc.—eventually even to the extent of acting as an all rounded representative and mouthpiece for his social group in establishing relationship with other groups. The young and growing child learns his first systematized rules mainly through family precepts, playing with companions of his own age and through a lengthy formal scholastic education. Whatever phase of the lessons in human experience it may be, each is intended to teach to the inexperienced self the mechanics of inhibition and of correct expression.

That group instruction is in a constant state of readjustment is witnessed, for example, by the history of even the most abstract and formal of these systems, that of scholastic education. Here are illustrated the many changes in the conception of relative values and in the aim which the social group has entertained from time to time as to the proper relation of the individual to his group. We need to recall but a few of the main historical viewpoints to realize their diversity; recapitulistic, practical, disciplinary, humanistic, religious, idealistic, naturalistic, sociological, etc. Each in turn sought to set up a syllabus of rules and aims which, through their retroactive effect, were so to organize individual consciousness as to curb or develop only such activities of the ego as would advance individual welfare in such manner as would at the same time insure the desired group welfare and progress suited to the group ideal for that age. One system would arbitrarily postulate its mandates, demanding implicit mechanical obedience by the individual without caring whether that individual's censor understood or could assimilate the restrictions; another would endeavor to win the cooperation and endorsement of the individual by painstaking explanations; again, one would emphasize certain activities and aims, much to the detriment or even to the exclusion of others; another would place a similar emphasis elsewhere with equal narrowness. Similarly, our social, political, religious and other forms of education have undergone almost startling revisions, not only of the substance of their precepts but of the very objects underlying them.

Today we have broader vision, and the education that comes to us through so many distinct agencies is more harmonious in its aims than in the past. Group consciousness recognizes the value of versatility, of flexibility, of emphasis, particularly upon

those forms of education which not merely curb but help the individual to develop his best self by imparting those rules and aims which the censor most needs. With the greater complexity of community life, the diversity of individual interest and effort, the increasing homogeneity of large social groups through the aid of inventions, improved communications, an almost universal interchange of commodities and ideals, individual censorship receives practical demonstrations of the great bulk of community rules in most divers ways. Vicarious teachings through travel and through the rapid changes in environment are so general that they very thoroughly supplement all merely formal instruction. Examples of the consequences of an ego rampant in a community are thrust upon the attention of the individual censor from every side and make obvious the need and purpose of organized restraint to insure safe and happy intercourse within masses.

Thus in every possible way the censor of the individual is informed about the demands of life as far as these can be taught in advance from outside. Just as throughout the course of history, so, too, in the lives of individuals this training is a continuous process subject to revision in content and purpose as the environment changes. In their highest forms the rules and ideals of general consciousness are definitely codified in written and spoken language and in the language of a varied symbolism, all of which are incorporated in the teachings, customs, laws, ethical morality and religion of the group.

With this training in example, guidance and restraint from without it is now incumbent upon the censor to evolve its own set of rules and aims in a manner similar to the evolution and to the main outlines of this model. We are now prepared to proceed to define the origin and the nature of this individual censor.

The inconsistency of flaunting to the world at large a feeling of individual superiority early becomes evident to its owner as he winces under repeated and drastic rebuffs of his ego. Therefore, to shield this feeling from complete disruption under these attacks, the individual locks all evidences of it within his inner consciousness. Here it is kept hidden from observation from without. As there lurks a danger of an occasional unintentional escape, the feeling is suppressed under a new guise whose appearance is not objectionable to others. The individual now takes the position that he will develop a set of rules for himself beneath whose standards one of his superiority must not stoop. Thus, from a misconception of the meaning of physical entity which the individual first builds up out of the realm of sensation, general perception, and simple ideation, he transforms this feeling to an idealization of self. This idealization of self increases in proportion to his higher ideational emancipation from material conceptions.

Such selfidealization of necessity implies the scrutiny of all acts, thoughts and emotions of the primary ego to compare them with the demands set by the ideal. This is censorship. Censorship serves as the dynamic aspect of the ideal. This dynamic aspect is what external education strives to help into

action by the example of its precepts and restraints. Through the conversion of the earlier inner feeling of superiority and through the retroactive effect of this education from without idealization of self rises out of nebulous stirrings to definite form. As the outlines emerge they remain plastic to contact for a long time and are capable of considerable growth and development.

However, while normally the ideal resembles a living thing with capacities for growth, development and change, such is not always the actual history, for contact with a virulent primary ego and the often hostile attacks made upon it from the outside tend to disfigure it. It is then warped by fixations, mutilations, excrescences, perversions, inversions and other unhealthy conditions which in turn weaken its power of censorship. The psyche is then exposed to maladjustments to life situations which become the precursors of unhappiness and mental derangements.

Just as general consciousness places experiences and their lessons in cause and effect together under various headings in accord with their meaning and activity, so the idealized self soon surrounds itself with certain concepts. These concepts are the foci about which all rules pertaining to that subject are catalogued and upon which the censor relies for guidance. When correlated, these foci in time form the structure known as individual morality.

Among the many such foci which might be mentioned as particularly important is the concept of selfrespect, together with its vital complement, humor. About the concept selfrespect cluster the standards for preserving physical wellbeing, for maintaining mental cleanliness consistent with a sound morality, for insuring mental poise and control, for developing honesty with self in the recognition and appraisal of the primary ego, no matter in what crude form it wells up out of the unconscious. On the other hand, humor is necessary, not merely to help us to see the inconsistencies which exist in the broad world of men and things, but more particularly to enable us to recognize how incongruous some of our own ego transformations appear to others. An unbiased understanding of the oftentimes ludicrous rôles we ourselves play unwittingly, together with a kindly receptivity towards criticism, helps to show us how in future we must mold our ego transformations in better proportions before releasing them to outside view. He who lacks selfrespect and humor as definite and well developed concepts belonging to selfidealization lacks important factors necessary to mental health.

Another focus is the conception that effort must be centralized about certain aims of attainment. This concept we call ambition. Ambition establishes the intensity standard as well as the particular limits within which primary ego forms shall seek suitable secondary expression to insure cherished external effects. The intensity standard determines the degree to which the individual ego shall strive to stand out clearcut in group consciousness.

Similarly the reader may easily select other concepts necessary to a wellrounded ideal of self (such as reverence in a religious garb, ethics suitable to

social or business relations, love in the form of brotherliness, altruism or selfsacrifice). About each of these the ideal of self will group appropriate rules to permit the censor to have a comprehensive control over the ego in whatever garb or in whatever situation it makes its presence known.

We speak loosely of these foci as the individual's various ideals. It would be more correct to say that they are but separate aspects of a central ideal, this very ideal of self. A frank scrutiny of our many different ideals will show us that they are nothing else than standards of measurement in terms of moral values for selfconduct. We understand how to be honest, unselfish, brave, and religious—only to the extent that we have set up an ideal of ourselves and imagine our personal rôle in enacting the rules which we believe to be consistent with these ideals.

Most of us greatly prefer to keep the struggles between our ego and the world outside down to a minimum. This means conserving energies which might otherwise be wasted through diffused efforts in selfassertion on unessentials. Or it spares the uncreative the physical discomfort and the mental travail that high ambition, for example, entails by forcing distinctive ego forms upon a hostile world for acceptance. Equilibrium is easiest of attainment when the group ideal and the self ideal are as nearly identical as possible. Individual censorship then becomes a mere imitation of external restraints. Most of us definitely seek such equilibrium in all ordinary occupations necessary for the pursuit of health, comfort and happiness. In an environment of peace, habit, conservatism, it is not necessary to stimulate high ideational centres to keep this equilibrium serene for carrying on a routine existence. But we must possess a docile ego which allows itself to be externalized in whatever guise is desired without raising an issue. At such times we are simply average in our reactions dormant in effort, in a rut. Stagnation would soon result in any group where all the members continued undisturbed in their pursuit of such a supine existence.

Fortunately for an active evolution, however, few social groups become stagnant nowadays. Even the average person reposes in false security if he depends upon such imitative censorship to suffice in all situations. Even he possesses certain primary ego forms which will refuse complaisance to accept only such secondary transformations as will not conflict with exterior standards. Instead they will struggle obstinately with their censor for recognition on the merits of their distinctive appearance and value. The group is then likely to witness an outburst of individuality which will be duly put to the test of public opinion.

Again, as communities in these days of travel and industrial flux seldom remain constant in membership for more than brief periods, individuals shift about from one environment to another. Group standards vary. Even where this variation is slight, an equilibrium founded upon weak, imitative censorship is in danger of serious tremors with each change. An imitative censor has to have time to discover and assimilate the new rules. Such slight variations accompanying a moderate number of

changes of environment have a beneficent effect on the censor in that it becomes accustomed to readjustments. But rapid and radical changes from one environment to another, such as sudden upheavals in the social order and violent emotional storms, all of which demand immediate reactions to totally different or unfamiliar standards, find such a censor so unprepared to function as to be quite useless. It suffers immediate breakdown and can exercise no restraint during the instant clashes between the new mandates outside and the stampede for the open which is made by the primary ego forms. The old battles must be fought once more before equilibrium can be reestablished. When such loss of control occurs we say that for a time at least the individual has lost the veneer of his civilization. This is sometimes never regained.

But every group has in addition to a majority membership of average citizens, at least a sprinkling of individuals who are not satisfied to be average and who therefore do not conform to group standards simply on a basis of imitation. Through greater selfidealization, which must be prefaced by higher ideation than that needed to meet the immediate demands of environment, such persons develop an inner censorship which shows an increasing independence of outer standards. Through more varied and more mature experience, through the observation of remote relationships, of cause and effect, etc., ideation has enabled idealization not only to rise to greater heights but has prepared the ideal to foresee demands which might suddenly arise. Thereupon the ideal has instructed the censor how to meet eventualities. Thus the individual can maintain equilibrium in the face of radical changes of environment, sudden social catastrophies, emotional strains and any other severe tests with which the censor might have to cope.

We are now prepared to understand that personality is a composite effect which the individual makes upon others, the sharpness of outline whereof depends upon the extent to which idealization has taken place and has demonstrated its dynamic power to censor the primary ego before it is permitted freedom in its secondary forms. Regardless of a common heredity idealization of self and censorship are individual. Only in so far as we can lay bare this idealization and this censorship are we able to understand the relation of individual to general consciousness, are we given a key to each personality. This explains the marked differences in individuality that exists between brothers and sisters, families and communities or nationalities, etc.

From the viewpoint that censorship is the dynamic side of idealization of self, it follows that imperfections or errors in this censorship must be due either to a faulty ideal or to inconsistencies in interpretation causing differences between the idealistic concept and the censor's practical application thereof, especially in the cases of those ego forms which are insistent upon immediate liberation. That these imperfections or errors whatever their cause, are very common is manifest.

Where the fault lies with the ideal itself correction is difficult unless it is merely a question of juvenile immaturity. We have observed that the

ideal is the result of subjective developments within inner consciousness. If an improvement or change is to be effected, this must result from an inner reappraisal of self. In youth such a reappraisal might follow a series of severe defeats at the hands of one's own ego which brought social ostracism or other community punishment as a result. But after childhood and early youth the plasticity of the psyche has diminished to such an extent that such reappraisal is seldom successful or even voluntarily considered. In the adult the psyche as a whole is often unhealthy, abnormal or incomplete. When ego triumphs over a faulty ideal, selfrespect, ambition, honor, love and all other focal concepts upon which a sound ideal should be founded prove themselves in this case to be but shams, substitutions, adulterations. They cannot give the censor the necessary strength to resist the pressure. Either the framework they form for the ideal must be shored up from within by a sudden selfrevelation and be replaced as promptly as possible by permanent and honest materials or both framework and ideal must collapse. In some cases outside assistance may accomplish results indirectly. This is possible when some powerful external example or suggestion can be interpreted by the self to be auto-suggestion. Then the feeling of separateness of self from the outer world is momentarily lost in a confusion as to which is which and in unhealthy minds especially this confusion may persist over considerable periods. More often it is fleeting in character and temporary in effect. Usually society can do little for or with the individual whose unhealthy abnormal or incomplete psyche can unfold only an imperfect selfidealization. Ordinarily it simply takes purely repressive or protective measures in its own interest. It calls such an individual permanently insane, criminally defective, feeble-minded, etc., and seeks to make him harmless whenever he threatens community life with ego forms dangerous to others.

Where the imperfections or errors in censorship are due to a hiatus between a correct idealistic concept and its practical realization into ego action, correction may be more easily effected either by readjustment within or by direct outside influence. The outside world offers its wealth of historic and current examples of concrete idealism. Most misinterpretations of the individual's own ideal may readily be modified by finding the proper prototype already existing outside. The censor has but to search. Where actual pathologies in censorship exist which interfere with the free search for the right prototype, the physician, the psychoanalyst or some other intermediary can usually effect the connection and establish a harmonious relation between the idealistic concept and its dynamic interpretation.

In fact, a very large proportion of the successful corrective treatments of mental cases are due to establishing such harmonious relations. Where no prototype exists the censor, after a possible succession of failures, must await further ideational evolution of the ideal whereby the concept to be interpreted will be clarified. Then the censor may proceed to call into play such ego forms as will execute the required transformations. But the cen-

sor of the ordinary normal person is rarely at a loss to understand what interpretation to put upon his ideal. This is more likely to occur where persons possess special abilities, talents or genius of a creative kind which seek new vehicles of expression.

It is not within the scope of this general presentation to enter upon more than a very brief survey of some of the common defects in censorship based upon errors in idealistic interpretation. Their intensive study opens up the broad subject of the range of types of personality, their variants and their characteristics. It furnishes an insight to practically the entire gamut of psychoses encountered in mental pathology.

Let us revert for a moment to our visualization of the three phases of consciousness. Idealization of self being subjective, we shall expect to find the censor enthroned in the middle room—inner consciousness. Here it creates, struggles and errs, acting as buffer, mediator, advisor and master on the battleground where untamed and uncouth ego forms of heredity meet the hosts of personal and social precepts which would bar the path to their ruthless expression. Therefore the censor to be efficient in exercising his control, should possess adaptability to meet the ego in whatever guise it rises out of the unconscious and should be in instant command of suitable transformations for externalizing each ego phase. Likewise it must possess strength, ingenuity and judgment sufficient to cope with the powerful and strange shapes through which the ego may make its appearance.

Common errors of the censor are those of being too strict, too lax or unstable in interpreting idealistic standards. Excessive severity keeps the door to inner consciousness shut to all but the most docile ego assertions. If perchance an admitted form becomes restive while being shorn and transformed, it is promptly ejected and cast back into the unconscious. The docile forms which remain in good standing become so few and are so regularly transformed into stereotyped patterns that they do not represent the virile ego which is being forcibly relegated to inaction. Painful repressions and distortions are effected by too ascetic, too consistent, too literal an enforcement of the rules. At best, inner consciousness becomes cluttered with multifications and fixations. These in time may accumulate such strength as to offer serious resistance. The upheaval may confine itself to the upper room and be quelled eventually. But not infrequently the censor himself has been chastened with the result that it enters into compromise with the ego. This often seems to be the real history of many a missing person who is discovered in new surroundings under a new name after having suddenly dropped completely out of sight at home without clue or explanation. Censor and ego have agreed to interpret the ideal self anew by making a fresh start. As this could not be effected among the old associations, a new and sufficiently remote environment is selected. Such disappearances are particularly characteristic among adolescent boys and girls who run away from what they deem undue external restrictions. In reality it usually is a wild ego assertion against too strict an interpretation of the

personal ideal. The immediate external incident is but the signal for revolt. In later years under new surroundings, the individual will almost invariably realize that even the external event was a correct interpretation of his own ideal though harshly applied. With a more friendly censorship he will successfully fulfill the very idealistic concepts which at an earlier time caused such upheaval.

Laxity of enforcement of restraints results in admitting disruptive and dangerous ego forms to inner consciousness. Under slipshod censorship these will escape into objective expression in flimsy guises which do not deceive even the censor as to the sinister acts they may immediately commit upon reaching the outside. We say that such individuals are too impulsive. Many of the crimes and other regrettable acts which constantly occur in every community have no other origin than carelessness in censorship due to laxity in applying the existing idealistic standards.

Instability in censorship is a frequent cause underlying peculiar forms of personality. The censor is inconsistent in his enforcement of the rules. At one time he will hold the ego down to rigid restraint; at another he will be almost indifferent how the ego emerges into the world. Or he will emphasize now one rule, now another for the same ego form. Such censorship is characteristic of emotional individuals and is a frequent cause of multiple personalities.

The censor that causes the most startling and varied transformations is the unhealthy one. Strange as it may seem, an individual may have a high ideal of self and at the same time possess a censor that is wholly or partially paralyzed, vicious, corrupt, negative, perverse. The individual fully recognizes the standards of his high ideal, yet is unable to make that ideal function in terms of action in accord with these standards. His ego will be thrust upon the world by the censor in forms wholly at variance with his desires. He will knowingly commit acts which he himself condemns. The reasons for such contrariness and failure on the part of the censor are many. It is possible that the ideal, through purely ideational evolution without concomitant actual graded practice, has left accomplishment in terms of action so nebulous that the censor is helpless to translate abstract rule into concrete act. Again, the censor himself suffers fatigue, loss of strength, weakened resiliency, amputations, scars, etc., through his constant conflicts with the primary ego. This leaves him in serious ill health or even diseased. He suffers amnesia regarding whole sections of the ideal's concepts and their concentric sets of rules. The existence of the whole catalogue of restraints and precepts connected with self-respect, with honor, are forgotten. The individual retains his knowledge and belief in them, will discuss them, yet will be unable to influence his censor to observe them. We see practical examples of this phenomenon on many sides. We recognize selfishness, loss of self-respect, lack of humor, treachery, cowardice, etc., in individuals we know possess the true concepts in well developed form, who have observed them at an earlier period in their lives, but who now do not practice even the most evident rules. This unhealthiness of the censor in time assumes more seri-

ous forms, such as hysteria, dementia præcox, sexual perversions and inversions.

Thus we see that personality, while doubtless influenced in its outward guise by the kind and degree of individual selfidealization, is particularly the result of the type of his censorship. Nor do we judge an individual's personality by the total work of his censor (for this includes his activity in admitting the primary ego and governing conscious life within inner consciousness), but only by the accredited transformations into secondary ego forms which this censor sends out into the world.

In closing, the following résumé may be helpful: We have sought a closer understanding of the evolution of the ego as it wells up in its primary forms out of the unconscious, undergoes transformations within inner consciousness and is then launched into the objective world in guises acceptable to group standards. This evolution involves certain factors whose functions we sought to analyze. From the early material misconception which gave rise to a feeling of the individual superiority of our own clay there develops the idealization of self. This represents a subjective evolution and results from arranging ideational and spiritual concepts in focus for suitable interpretation in terms of ego

transformations. For accomplishing this, the ideal brings into play its dynamic side—the censor. Both ideal and censor are a part of self distinct from the ego they govern. The censor is guided by the definite restraints and precepts grouped about the concepts (or ideals) which form the framework for the ideal of self. These concepts and their rules are the combined result of external example presented to the individual in youth through formal and practical education and of personal ideational evolution. As the idealization of self is a subjective development, it cannot be altered directly through external interference. On the other hand, the censor is a plastic reflection of environment and of ideal of self and is therefore readily readjusted from without or from within when ordinary difficulties in interpreting either community or idealistic standards arise. But the type of censor varies in different individuals, thereby causing differences in the transformation of similar ego forms and also giving rise to inconsistencies between selfidealization and selfexpression. As these variations in censorship are the controlling factors in ego externalization, their study gives us the key to understand the causes of variations in personality.

600 DARROW AVENUE.

Pulmonary Tuberculosis in Young Children

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Marked or well advanced tuberculosis is readily recognized, but attempts to overcome the infection and to prevent its further progress are rendered more difficult the longer the infection has persisted and the further it has invaded the tissues. Therefore, it is of the greatest importance that the disease be recognized early.

Statistics show that tuberculosis is frequent in children. These figures have been generally high, averaging from thirty to fifty per cent. of the lesions found in postmortems. Bradley (1) says that during 1919, 2,207 deaths from tuberculosis in Pennsylvania occurred in persons under nineteen years of age, and that during the same time for the same age period there were 515 deaths in Philadelphia. These figures are not based upon autopsy findings, but upon the clinical diagnosis of the cause of death. They, therefore, probably represent only in part the entire number of deaths in which tuberculosis was present.

Cooke and Hemplemann (2) describe as a separate clinical type masked juvenile tuberculosis, which they think is sufficiently distinctive to warrant a position in the classification of tuberculous affections of childhood. The characteristic clinical picture shows a history of frequent coughs and colds, attacks of unexplained fever, anorexia, loss of weight and asthenia, and apathy. Physical exami-

nation reveals more or less evidence of malnutrition, anemia, manifestations indicating involvement of the tracheobronchial nodes, and usually some variation from the signs elicited over the normal lung. There may be phlyctenular disease or tuberculides. The von Pirquet test is positive, as are also the intracutaneous tuberculin tests. In children past the fourth or fifth year seventy-five per cent. give positive complement fixation tests for tuberculosis. X rays often reveal unsuspected lesions in the lung tissue, as well as involvement at the hilus of the lymph glands. The diagnosis is based upon a consideration of all these points.

The routine examination of all children in the Children's Clinic of the Samaritan Hospital has revealed a frequent incidence of incipient, masked, and frank juvenile tuberculosis. Except in the latter type improvement has followed simple therapeutic measures, especially hygienic and dietetic care. These results seemed sufficiently constant to warrant calling attention to the benefits to be derived from early recognition and treatment in the first two classes of cases. A few illustrations are offered.

CASE I.—J. I. H., aged nine years, presented an example of easily recognizable variations from normal that were not recognized because there had never been an examination of the chest. On ac-

count of the child failing to improve under treatment, a former patient of the Samaritan Hospital recommended that he be brought there for removal of his tonsils and adenoids. He was a mouth breather, had occasional sore throats, but frequent coughs and colds. He was backward at school and at play, and was overmodest. He had whooping cough at twenty-two months, and had also had chickenpox. The father and mother were both living and well. There was one sister living and well, and one brother, who had been badly burned some months before. Physical examination revealed that the tongue was clean and moist. Several teeth were missing, and one was carious. The tonsils were enlarged, especially the left. The chest was long and thin, expansion poor but equal, with resonance slightly impaired over the right side both anteriorly and posteriorly, and over this area there was some roughening of breathing with prolongation of expiration (bronchovesicular breathing). Tactile and vocal resonance were increased, while over the left side the sounds were normal. The heart was slightly enlarged to about three cm. to the left of the mid-clavicular line, the sounds were of poor tone, and there was an inconstant systolic murmur at the apex. There was a marked phimosis. In view of the physical findings it was deemed inadvisable to have the tonsils and adenoids removed, and it was recommended that dietetic and hygienic measures be followed until the pulmonary condition might permit of operation.

CASE II.—R. V., aged seven years, presented another illustration of this type of case. He was brought to the hospital complaining of a cold, which had persisted for more than a week. He was unable to sleep on account of coughing, which was continuous. The cough was dry; there was no expectoration. He had had a similar cough every winter. He had some coryza, and his mother thought that he had some sore throat. His bowels were regular. He had mumps in 1920, but had had no other illness. The father was living and well. The mother had a similar kind of cold. There was one sister living and well. The patient attended school.

Physical examination showed that his tonsils were enlarged, the nares were occluded, several teeth were missing, and several of the permanent set were erupting. There was enlargement of the cervical lymph glands. The tongue was clean and moist. His posture was stoop shouldered, scapulae prominent. The chest was poorly developed and nourished. Expansion was poor but seemed equal. The lungs showed impaired resonance amounting practically to dullness over the greater part of the right lung, and over this area there was increased tactile and vocal fremitus with roughened breathing and prolongation of expiration or bronchovesicular breathing. The left lung seemed normal except for a slight variation from normal resonance. The rate of the heart was increased; no murmur was heard; the second sound at the apex was accentuated, the tone was fair, and there was no evidence of cardiac enlargement. The nose and throat department reported that there were large irregular tonsils, with the nares partially occluded with mucus. The breathing space was fairly clear, although there was

a good sized mass of adenoids. An x ray of the chest showed no evidence of tuberculosis. After treatment at a later period examination of the lungs showed that the signs were clearing up. He seemed much better. His color had improved, his face was fuller, and he had gained in weight. The only complaint was night sweats.

CASE III.—P. W., aged six years, who was brought to the clinic complaining of a cold which had existed for about a week, presented another striking example of this type of involvement. There was considerable cough, with expectoration of a light colored fluid, which was worse at night. He had been subject to frequent colds, and was usually constipated. He had had measles at two years, whooping cough at four years, and no history of any other illness except frequent colds and tonsillitis. He had been under treatment in the surgical dispensary for a laceration of the head, which had no bearing on the complaint for which he came to the children's clinic. His father was living and well. His mother was under treatment in the medical dispensary for diabetes. Four brothers and three sisters were living and well. One brother was under treatment at the Naval Hospital for stomach trouble. The child spoke with a decided impediment of speech, and was understood with difficulty.

Physical examination showed that his nares were occluded, and the tonsils greatly enlarged. The tongue was coated, and there was some cervical adenitis. The chest was thin and lacking in subcutaneous fat, but the muscles were well developed. Expansion was poor at the right apex, there was dullness both anteriorly and posteriorly over the right lung, and anteriorly the dullness was accompanied by increased vocal resonance. The breath sounds did not seem to be increased, but there was some prolongation of expiration, and sonorous râles were scattered through both lungs. The von Pirquet test was negative. X ray showed extensive adenitis at the right hilus, indicating incipient tuberculosis of the right lung. Under treatment his general condition improved. He became brighter, more active, had a better appetite, and began to gain color and weight. After a few weeks the signs in his chest began to clear up, although they persisted for more than a month more. After this time his lungs seemed normal, he had no cough, and there had been a marked improvement in his general health so that his condition seemed to warrant removal of the tonsils and adenoids.

The cases already cited were either examples of incipient tuberculosis or probably of pretuberculous manifestations. They are only a few instances taken more or less at random from a number of such involvements that have been observed in one of the three divisions of the Children's Clinic. A case, which was under my care in another institution, so well illustrates the type of masked juvenile tuberculosis that I feel justified in adding the history to this presentation.

CASE IV.—The patient, a boy, C. L., aged five years, was brought to the hospital for weakness and fever. He was admitted October 5, 1920; since September, 1919, he had not been well. At that time he had an illness which had been diag-

nosed as typhoid fever both clinically and from positive Widal reactions. After this illness he did not gain as he should have. In May, 1920, he had another somewhat similar illness which was diagnosed as paratyphoid fever by laboratory findings. Since these illnesses he had been very weak, had poor color, no appetite, and was very apathetic. He was rather constipated. There was no cough, but he frequently had colds. Tonsillectomy and adenoidectomy had been performed two years before. The fever which he showed at the time of admission occurred from time to time. Just prior to coming to the hospital it had been associated with considerable and definite rigidity over the gallbladder region. His past medical history was negative except as already set forth. He had never had any of the diseases of childhood nor any other infectious condition, such as influenza or pneumonia. Examination showed a pale, weak looking boy, who seemed apathetic and undernourished. No gross deformity could be noted except a slight lateral curvature of the spine. His head was negative, but the face was pale and thin. The tonsillar bed was clear, but the pharyngeal wall was fibrous and rough in appearance. The cervical glands were palpable, but not greatly enlarged. The posture was somewhat stoop shouldered. The chest was thin and poorly nourished, expansion fair and equal. The clavicles and scapulae were prominent. Percussion showed little or no variation from the normal. There was some roughening of breath sounds over the left apex and the right base, but no râles or other adventitious sounds were heard. There was apparently no enlargement of the heart, and the sounds were of fair tone. The cardiac rate was rapid, but no murmur was heard. The abdomen showed some lack of tone of the large muscles. There was no apparent enlargement of the liver or the spleen, and there was no rigidity or tenderness over the gallbladder region. No tumors or masses could be felt. The extremities were thin but were otherwise normal.

Five days later examination of the chest showed that there was a slight increase in vocal resonance at the left apex above the posterior scapular spine. There was slight bronchovesicular breathing. There was no sense of resistance or tenderness over the lower rib margin or over the gallbladder area. The condition remained the same for more than two weeks, there being a temperature range between 97° and 100°. After this period subsequent to catching cold the temperature rose to 102°, fell to 100° and rose again to 104°, after which it ranged irregularly from 98.6° to 102.6° for nine days. After five days of normal temperature there was another flareup and a period of normal temperature for sixteen days followed by another similar flareup, on the subsidence of which he was discharged.

Beginning with this febrile period his physical signs changed somewhat. There was increased dullness at the right apex, especially in the first interspace, shading into an element of resonance at the third space. The breath sounds over this area were not increased. Dry râles were heard all

over the chest. Just prior to discharge physical examination showed dullness over the right apex anteriorly from the second space upward; posteriorly the note was impaired over both apices, but more especially over the right. The breath sounds were distant over the right apex; dry, sibilant, and sonorous râles were heard all over the chest. The voice sounds were lessened over this region. Laboratory studies were made. Examination of the stool for tubercle and typhoid bacilli was negative. Blood examinations showed red blood cells 4,990,000; white blood cells 22,300, hemoglobin eighty-five per cent.; polymorphonuclear leucocytes forty-seven per cent.; small lymphocytes forty-eight per cent.; large lymphocytes two per cent.; transitionals three per cent. Blood smears were negative for the plasmodium malariae.

The first Wassermann test was reported as doubtful, but another made a week later was negative. Many attempts were made to collect sputum for examination but without success. The von Pirquet test was positive. The x ray studies were interesting. The first made a few days after admission showed consolidation of the upper right apex. It was impossible to tell whether this was fluid or a mass as in unresolved pneumonia. A week later the x ray findings were that the condition remained much the same, but the mediastinal glands at the right hilus were more enlarged. Two weeks later it was reported that the upper right lobe was still thickened, and the mediastinal glands were still enlarged. This area of consolidation or fluid seemed to be gradually lessening in density. A final x ray was taken previous to discharge. This showed about the same conditions as in the last examination. After going home the improvement in the general condition was progressive for about four weeks, when he was seized with another febrile attack with an acute cold and cough ushered in by vomiting and associated with marked abdominal tenderness and rigidity, this time over the appendiceal region. Appendicitis was so markedly simulated that the attending physician felt inclined to operate. After a few days the attack subsided and the abdominal symptoms disappeared, and after a short time the cough again improved.

The child was seen a few weeks ago and his general appearance showed a marked improvement over his appearance on admission. The physical signs still remained much the same as at the time of his discharge from the hospital. The improvement in his general condition was, however, very apparent, in his good color, round face, well nourished body, animation, and happy expression. This case is not to be considered as terminated. Care and observation must be practised even past the years of adolescence and well into adult life. There was here a latent, or perhaps more accurately speaking, a masked focus of infection which became activated as a result of an acute catarrhal infection.

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313 SOUTH EIGHTEENTH STREET.

Hyperchlorhydria in Childhood

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There occurs in childhood, most frequently during the period between the termination of the first dentition and the beginning of the second, a symptom complex or syndrome referable to a disturbance of gastric function, secretion and motility. The symptoms, one of several of which may be present, are 1, disturbance of appetite, 2, abdominal pain, 3, nausea and vomiting, and 4, constitutional symptoms. Because of good therapeutic results, obtained by the elimination of dietetic irritants and poor feeding methods and the giving of alkaline antacids, these cases have been ascribed to hyperchlorhydria. Thus Hutchinson (1) refers to the case of a little girl who complained of abdominal pain shortly after meals, which was relieved by carbonate of magnesia. He supposed the pain was due to overproduction of acid, and he believed that such cases were uncommon.

Early in the history of gastric analysis M. Rosenthal, of Vienna, published, in 1887, a paper on hyperacid vomiting and its effect upon the urine, and reported that in a number of children between the ages of seven and eleven, suffering from paroxysmal vomiting, the vomitus was hyperacid, and that at the same time the urine showed a decrease of chloride. He refers to a previous work of Rossbach in 1884 describing a condition of gastroxynsis, occurring in young neurotic school girls, characterized by paroxysmal vomiting and hyperacidity. In 1885, Teppe described a similar condition as gastroxie.

In 1897, Soltau Fenwick (2) described paroxysmal hyperchlorhydria as a cause of abdominal pain in children. He cites cases in which abdominal pain occurred, with vomiting, preceded by headache, manifested for the first time at the age of four. The vomitus acidity was 0.45 to 0.52 per cent. of hydrochloric acid, the normal being about 0.2 per cent.

Most of the work done since has been on the gastric secretion of infants. The majority of observers are agreed that the amount of free hydrochloric acid in early infancy is very small, in fact, often *nil*. Thus the investigations of Sotoff showed that in early infancy the total acidity of the gastric juice was 0.02 per cent. forty minutes after suckling and 0.08 per cent. eighty minutes after suckling. Most of this is due to fatty acid, free hydrochloric acid being about 0.0088 per cent.

Hahn found the acidity of the gastric juice in infants, as expressed in terms of hydrogen ion concentration, to be 1×10.5 at the height of digestion.

McClendon investigated the change of hydrogen ion concentration of the stomach in the adult and infant during the progress of digestion by lowering a hydrogen electrode into the stomach. By taking quarter hourly readings, he found that the acidity of the adult stomach rapidly rose during the first one and one half to three hours after a meal, after

which it remained stationary until the food had left the stomach. In an infant, in the first month the acidity rose slowly during the first hour, but after that it rose rapidly; four hours after nursing it might be as high as in the adult.

The occurrence of hyperchlorhydria in infancy was described as an unusual condition by the French observers, Oddo and DeLuna. They described eight cases of hyperchlorhydria in infants of four months, seven months, eighteen months, nineteen months (two cases), twenty and twenty-one months. All these infants were dyspeptic. They showed hyperacidity varying between 0.148 and 0.475.

Knoepfelmacher, a German, described a case in a baby girl of ten months in whom at different examinations the free acid varied from 25 to 55 and the total acid between 82 and 105. Cases were also referred to by Hecker, Raudnitz, Bauer and Deutsch.

As far as I know, however, there is no study in the literature of a series of gastric examinations in supposed hyperchlorhydria in children. In the cases I am reporting, seen in private practice, gastric examinations were made, gastric juice being obtained one hour after a test meal consisting of a few biscuits and a glass of water. The analyses were made by a modification of the Töpfer procedure. They showed hyperacidity.

The constitutional symptoms of the children in this group were interesting. They were nearly all dark or sallow complexioned. They tended to be hyperactive and yet tired easily, especially in the afternoon. They were all of the nervous type. In view of the observations of John Rogers on fatigue disease in relation to the thyroid and adrenal glands, and their effects upon the gastric secretions and hyperchlorhydria, determinations of the blood pressure were made in those above the age of three. It was found consistently lowered. Blood sugar determinations were also made. Results are shown in the following table:

	Free HCl	Total HCl	Blood pressure	Blood sugar
M. B.....	58	70	....	0.85
I. G.....	62	80	70-55	0.72
E. H.....	60	76	80-64	0.80
J. L.....	60	78	75-60	0.78
J. L.....	48	85	70-58	0.72
L. M.....	48	90	78-60	0.90
A. H.....	38	70	68-60	0.65
B. S.....	40	60	....	0.95
J. K.....	50	84	80-60	0.75
P. S.....	40	60	75-60	0.88
J. B.....	42	76	70-55	0.80

The abdominal pain was variable, sometimes occurring directly after meals, sometimes in the morning or at night, or awakening the child from sleep. It was nearly always umbilical or epigastric. It might last for hours. The anorexia was also variable, being intermittent in some cases, in others constant, and in a few characterized by being pres-

ent between meals, but destroyed by a small amount of food. The vomiting occurred most frequently after meals, especially after the evening meal.

CASE I.—M. B., two and a half years old. Patient suffered from abdominal pain, with frequent vomiting after meals, and occasional attacks of pain at night. Physical examination of the abdomen was negative. The child's breakfast consisted of orange juice at 7.30 and at 8.30 cereal, against which she rebelled. At 12.30 she had lunch, with hot broth or soup as the first course, and at supper she ate an egg. Test meal showed hydrochloric acid 58, total acid 70 and blood sugar .85 per cent.

CASE II.—I. G., aged five years. Patient had a poor appetite and presented alarming symptoms of fatigue in the afternoon. Breakfast began with orange juice and the patient ate a good deal of ice cream and pastry with candy and milk frequently between meals. Physical examination of the abdomen was negative. Test meal showed free hydrochloric acid 62, total hydrochloric acid 80, blood sugar .72 per cent. and blood pressure 70-55.

CASE III.—E. H., aged four years. Patient suffered from frequent paroxysmal attacks of abdominal pain. Several attacks of pain occurred at night, with screaming, hypodermic injections of morphine being required to quiet the child. Physical examination of the abdomen was negative. Orange juice was given in the morning before breakfast and highly seasoned beef or a chop, with other condiments, for lunch. Test meal showed free hydrochloric acid 60, total acid 76, blood sugar .80 per cent. and blood pressure 80-64.

CASE IV.—J. L., aged six years. Patient suffered from lack of appetite, with nausea before meals, and occasional attacks of vomiting and abdominal pain. Sliced orange or other raw fruit was eaten for breakfast and salad with French dressing for lunch; coffee at night. Physical examination of abdomen was negative. Test meal showed free hydrochloric acid 60, total acid 78, blood sugar .78 per cent. and blood pressure 75-60.

CASE V.—J. L., aged four years. Patient suffered from abdominal pain and indigestion and was always thin. There was a history of difficulty in feeding in infancy and various attempts to fatten. The child was ten pounds underweight and was being fed every two hours, with ice cream at least once a day and six teaspoonfuls of cane sugar with cereal. Physical examination of abdomen was negative. Test meal showed free hydrochloric acid 48, total acid 85, blood sugar .72 per cent. and blood pressure 70-58.

CASE VI.—L. M., aged five years. The patient was thin and suffered from recurring abdominal pain and frequent colds. Epigastric pains occurring paroxysmally after meals, sometimes spreading to appendiceal region, were relieved by bicarbonate of soda. Physical examination of the abdomen was negative and fluoroscopy showed hyperperistalsis of the stomach. Test meal showed free hydrochloric acid 48, total acid 90, blood sugar .90 per cent. and blood pressure 78-60.

CASE VII.—A. H., three and a half years old. There was lack of appetite, with abdominal pain

occasionally. The child's appetite was so poor that it would touch no food except milk, of which it took about a quart and a half a day at irregular intervals. He vomited often small quantities of sour smelling material. The child was dark complexioned, pale, flabby and underweight. Physical examination of the abdomen was negative. Test meal showed free hydrochloric acid 38, total acid 70, blood sugar .65 per cent. and blood pressure 68-60.

CASE VIII.—B. S., aged two years. The child suffered frequently from abdominal pain and anorexia. Breakfast consisted of orange juice with a fried or a scrambled egg; lunch, steak of roast meat with hot soup; supper, boxed cereal and ice cream or candy. Test meal showed free hydrochloric acid 40, total acid 60 and blood sugar .95 per cent.

CASE IX.—J. K., aged four and a half years. Patient suffered from vomiting after meals. Appetite was not very good but patient ate his meals and vomited after nearly every meal. The vomitus was very sour. The vomiting, which occurred about an hour after every meal, was occasionally preceded or accompanied by umbilical pain. The child was pale, underweight, and generally constipated. Physical examination of the abdomen was negative. Test meal showed free hydrochloric acid 50, total acid 84, blood sugar .75 per cent. and blood pressure 80-65.

CASE X.—P. S., aged four years. The patient was sallow, poorly nourished, had a poor appetite and suffered from eructation of gas and abdominal cramps after meals. The abdomen was negative except for tenderness in appendiceal region. Test meal showed free hydrochloric acid 40, total acid 60, blood sugar .88 per cent. and blood pressure 75-60.

CASE XI.—J. B., aged three years. Patient suffered from frequent umbilical pain, sometimes related to meals, and cramps which at times were very distressing. The appetite was capricious and there was occasional vomiting. Physical examination of abdomen was negative. Test meal showed free hydrochloric acid 42, total acid 76, blood sugar .80 per cent. and blood pressure 70-55.

Of these eleven children ten were given orange juice in the morning, when the stomach was relatively empty. All of them received in addition other gastric irritants in the form of highly seasoned or sugar concentrated foods. That these played a part in the production of the symptoms was demonstrated by the therapeutic response to their elimination. The return to orange juice, regarded quite superstitiously by some mothers as a divinely ordained constituent of the diet, as well as an appetizer, always produced a return of the symptoms. Yet many children do take orange juice and other fruits, as well as the other gastric irritants, and are apparently not adversely affected by them, no interference with their appetite nor vomiting or abdominal pain being produced.

The occurrence of these symptoms may perhaps be explained by the fact that they occur in a certain type of child, generally dark complexioned, with a tendency to low blood pressures and low

blood sugar and a relatively abnormal fatigability. This type seems to be disposed to a development of hyperchlorhydria under irritant food provocation. This predisposition perhaps depends upon a certain relation to the adrenal-sympathetic-thyroid mechanism of the organism, which controls the nerves conducting, inhibiting or stimulating impulses to the gastric cells. Although this remains to be determined, these cases point to the existence of a constitutional type, perhaps dependent upon a constitutional hypoadrenalism, in which gastric irritation and bad hygiene produce hyperchlorhydria, hyperperistalsis or disturbances of peristalsis of the stomach and accompanying symptoms.

All of these patients have done well under a general hygiene régime, with removal of the gastric irritants from the diet. Antacids and adrenal nucleoprotein also seemed to assist in the restoration of conditions to the point at which the symptoms disappeared, and general wellbeing returned.

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144 WEST SEVENTY-SEVENTH STREET.

The Prevention of Measles*

By ISAAC W. BREWER, M. D.,
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The importance of measles as a cause of sickness and death is not appreciated. In many cases the patients are never seen by a physician and of those who do come to the attention of a physician most of them are seen but once. For a number of years I have been deeply interested in the prevention of this disease and think that probably my experience may help others to avoid the errors into which I have fallen.

In the following table are presented some brief data regarding the morbidity and mortality of this disease which show its importance:

COMMUNICABLE DISEASES IN THE UNITED STATES AS REPORTED TO THE UNITED STATES PUBLIC HEALTH SERVICE.

Average for the years 1913 to 1919.

Disease	No. of cases	Case rate in 1000 of population	Death rate in 1000 of population
Measles	404,548	5.2	0.11
Diphtheria	110,992	1.3	0.16
Scarlet fever	100,321	1.2	0.03
Typhoid fever	59,103	0.7	0.12
Smallpox	37,085	0.4	0.005
Cerebrospinal meningitis	21,998	0.04	0.04

As a cause of sickness measles ranks first and as a cause of death it is third among communicable diseases. However, we know that most of the deaths from diphtheria are unnecessary and that typhoid fever can easily be prevented. In the case of measles it is quite probable that there are many deaths in which this disease is an important contributory cause. Vaughan, basing his opinion on the statistics of the Army during the World War, says: "Where one man without measles has pneumonia, two or three (2.6) men with measles have pneu-

monia. . . . Thus in 2,075 cases of pneumonia following measles 888 or 42.7 per cent. of the patients died. In 8,432 pneumonia cases not following measles 949 patients, or only 11.3 per cent., died. Measles thus not only predisposes to pneumonia, it predisposes to fatal pneumonia."

If there is ever produced a measles vaccine as potent as the typhoid vaccine, measles will disappear from the medical nomenclature, provided the people will avail themselves of this vaccine, which is rather doubtful. Until such a vaccine is developed and used we shall have to depend upon isolation to prevent epidemics of measles.

We all know that during the preeruptive stage the disease is highly infective and that with the appearance of the eruption the potency of the virus seems to diminish. It is only in rare instances that we are able to place a patient in isolation during the pre-eruptive stage, and that when the case comes to our attention the damage has to a large extent been done. In other words, the isolation we impose is of secondary importance. Unless we can arrange to have all cases isolated during the catarrhal stage we shall have epidemics of measles at regular intervals as soon as a nonimmune population of sufficient size grows up in the community.

In Watertown we have an epidemic about every third year and just now we are in the midst of one of the most extensive of which we have record. It began in January and there was an interval of eleven days between the primary case and the secondary ones arising from it. At that time we endeavored to discover the cases before the patients came down with a cold, and in a number of instances the Koplik spots were found before there were other symptoms, but many cases were not de-

*Read at the Conference of Sanitary Officers, Watertown, N. Y., May 25, 1921.

tected. In one instance a child was found in school with a rash on the body. The mother remarked that she was not sure it was a case of measles and therefore sent the child to school. We kept up our inspections until it was manifest that nothing further could be accomplished by that measure. So our epidemic got started and is now burning itself out and will cease when all the nonimmunes have been attacked.

In contrast to this are the conditions which obtained at a military station during the first nine months of the World War. Our post was designated as a reorganization camp and early in April, 1917, recruits began to arrive. With the first detachment came a man who was sick with measles in the eruptive stage. He was at once isolated and all of his companions who had not had the disease were inspected daily, their temperature being taken in the afternoon. Those with an elevation of temperature were isolated, and in this way we found a number of cases before they reached the catarrhal stage. Although there were constantly importations of the disease it did not spread beyond the primary contacts in any instance. It may be said that the disease was not virulent, but in a regiment which was camped nearby, and for a long time was not under our jurisdiction, they had numerous cases of measles during that time. Later when I became sanitary inspector for the entire camp and the same measures were put in effect there was no further spread among the new men.

This last story was told at the 1917 meeting of the American Public Health Association and was re-

ceived with doubt. Many of the best men in the country seemed to feel that it was impossible to prevent an epidemic of measles. Without doubt it would be difficult to inaugurate the plan followed at the camp but I know of one place where it was carried out with success. I do not believe in doing nothing and as soon as this epidemic has passed I propose to lay plans for combating the epidemic which may be expected in 1924.

We must acknowledge that the so-called cold is the point of attack and I hope so to impress this community that before the next measles epidemic they will see that all children with colds are isolated, or at least excluded from school. I have been told that the public would never stand for it, but I believe they will as soon as they realize what it means.

The trouble with most of our health legislation is that it comes before there is a demand for it. Not understanding, people resent the restrictions it imposes, and in many instances it is impossible to enforce the laws. We have a shining example of this in the regulation against spitting. In very few cities is it enforced, in most instances because the judges or the jury do not realize the importance of the ordinance.

In addition and to support the campaign of education which it is proposed to inaugurate, I hope our sanitary laws may be so changed that there will be less restriction of the liberty of the other members of the family. I think the time has come when we must recognize that in most of the common diseases it is not things but persons who are dangerous.

Children's Fears

By FRANCES RUSS-BARKER,
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Children's Era Organizer for Infant Welfare under the Auspices of National Baby Week Council.

Scientific investigators, doctors, and those who have studied child life, tell us that the making or marring of the child's bodily health, and, as a result, of its character and career, is very largely accomplished in the first years of its life, when the emotions of fear and love begin to develop. Perhaps the first to develop is fear; it is on record that an infant twenty-three days old has been known to evince fear. Clever, high strung children have, as a rule, many fears, most of them creations of their own little minds, but these same fantastic fears very often grip the child with such intensity that the effects on its life and health are sometimes of a most detrimental and lasting character.

Dr. Leonard G. Guthrie says: "The importance, long neglected, of acquiring knowledge of children, as well as of their diseases, is now recognized. If children were ill or ailing, the doctor was called in to prescribe for disease, but not on their management; he was not asked to see a child because it was wayward, but because it was wasting; not because it was dainty, capricious in appetite, refusing

food considered good for it and craving for all food that was unwholesome, but because it had pains in the stomach. Advice was not asked for peevish, passionate children, nor for those who were afraid of the dark or unnaturally timid, absentminded, or brooding and morose, jealous, spiteful, or cruel, nor for mischievous, untruthful, dishonest, or immoral children" (1).

All such defects were regarded as moral rather than morbid, and were treated as such. It was long before it was recognized that a child might be dull and stupid in consequence of defects of sight and hearing. We are likely to attribute an enormous variety of symptoms to one cause in particular, instead of to many different factors, and when we have removed or treated the presumed cause, we are much concerned because the child is not materially better. For instance, a child has night terrors, and as indigestion will certainly give rise to bad dreams, we think to stop the night terrors by treating the child for dyspepsia. Or headache is the complaint, and having observed a slight error in

refraction, we are disappointed that the headaches do not disappear when suitable glasses have been obtained.

In the case of adults, the effect of mental troubles on the course and origin of illness is well recognized. Medical treatment alone will not cure insomnia in a clerk who has been robbing a till, or dyspepsia in a wife who is jealous. Yet where children are concerned we often forget that the influence of their mental troubles may be as great or greater than our own in causing and prolonging their complaints. We know that excessive emotion of any kind, whether restrained or unrestrained, produces lowered vitality and prostration, enfeebled circulation, and disorders of the whole system; hence the importance of recognizing the presence of emotional excitability in early childhood.

Those who are neurotic will sympathize with the statement of George Eliot that emotional sufferings in early childhood are very great indeed: "that they were intensified by being neglected or ignored; that they affected our health as much as our happiness, and that we bear their traces still."

Dr. Guthrie traces ill health in after life, in many men and women of the greatest genius in our country, "to want of sympathetic and judicious treatment in their youth. Parents being nowadays fully alive to the effect of mind upon disease, expect to be told how ill health may be averted by mental as much as by medical treatment."

All children have an inborn sense of justice, and a corresponding inborn resentment of injustice, hence the importance of sifting evidence whenever an opinion is to be pronounced for or against the child. It is within the knowledge of the writer that a child spent many sleepless nights because of a wrongful accusation. No child should ever be allowed to go to bed brooding upon its wrongs, supposed or otherwise. This is likely to engender smouldering resentment, jealousy, or even hatred, and to darken the child's outlook on life, thereby having lasting ill effects upon its health.

Referring again to fear: Children, as a rule, have such fine susceptibilities that they read accurately the feelings expressed in the faces of those about them, and gauge exactly the emotional atmosphere around them. If mother comes downstairs not feeling good humored, the sensitive child feels it and his own mental attitude is similarly affected. If mother is nervous or unhappy, her emotions react upon the household; hence the importance of a mother learning to control her own emotions, expressions, and tone of voice, that in turn she may teach her child proportion and control. Take an everyday instance: Tommy, running along, falls; he has perhaps slightly grazed his knee, but being interested in his play would have recovered his balance and gone along as before. Mother rushes up, consternation and fear written on her face. "Poor Tommy," she exclaims, "where is my darling hurt?" etc. Tommy looks at the dirt on his clothes, sees a faint scratch on his knee, glances at mother's telltale face, and goes off into loud howls, showing at once the effect of her mind on his.

There are other objects of fear: Fear of the doctor, the policeman, the dark, witches, giants, hob-

goblins, dogs, the sweep, fear of being alone; all these and many other fears, if not sympathetically treated, wear down the child's nervous system, lower his vitality, render him susceptible to a thousand and one ailments, and in many cases account for morbid conditions in after life, from mental trouble downwards. To meet a child's fears with harshness or ridicule is a criminal fault, and is equal to mentally and morally murdering him. Children's fears should be met with sympathy and kindness, and, above all, with explanation.

The development of love in the very young child is fostered chiefly by example. Everyday kindness, gentleness, loving ways, etc., should surround him in the home and also in the school. In the home where there are jars, angry words, nagging, ungracious or rough behavior, we find that the children imitate their parents' methods of speech and conduct, and there is little atmosphere in a home like this for the development of the love inborn in every heart. In my experience the remark is constantly heard, "I can't understand why my girls and boys will not stay at home." The answer is, if the attraction of love and cheerfulness and sociable conditions are not in the home, those necessities will, of course, be sought elsewhere. Love should be developed in the home together with the idea of service. Children should be taught to do little acts of service from earliest infancy for mother, for father, and, above all, for each other; boys taking equal share with girls in home duties and service. Judicious praise should always be bestowed for such acts of kindness and service, because this will stimulate in the child a desire to become more worthy of the parents' loving appreciation. Parents and teachers should realize that loving ways and an appreciation of the child's efforts will bring forth results undreamed of, acting as a tonic, physical and mental. Nagging and faultfinding prey upon the nerves, mind, and general health, and make children resentful and stubborn. As a woman once said to me: "The children are so naughty, I'm always at 'em." What a hopeless situation for this family!

The old adage, "Know thyself," points out the only means by which it is possible to acquire knowledge of others. Therefore, the study of this fascinating and all important subject of psychology (which means selfknowledge) is recommended to all who have the interests of the young at heart.

But even knowledge will not suffice, unless its application is enforced with sympathy. The power to feel with a nervous child, to realize the burning sense of injustice in the heart of a child wrongfully punished, to look at life through a child's eyes, this power will do much to make the way smooth for both parents and children, both teacher and taught. Tact has been described as educated love, and sympathy might be described as love that takes trouble. It is much easier to scold a nervous child than to try earnestly to enter into its fears, and so banish them; but it is not too much to say that, for many a child, the treatment it receives in these respects is a matter of life and death.

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A Suggested Form of Treatment for Mental Deficiency in Children

By J. A. MILLER, M. D.,
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More than a decade has passed since the innovation of treating all types and grades of mental retardation in children and young adults by means of glandular therapy. And for this period various results from this method of treatment have been published all more or less optimistic as to the future progress on these lines. Following this theory the tendencies of the times have been an attempt to increase mental capacities by stimulating the brain cells or bringing into activity dormant brain cells through these glandular extracts by some obscure action.

It is my belief that this method of treatment is due to the improper understanding of the condition and causes of mental retardation and mental defectiveness. We cannot stimulate a dead body or an absent one. For example, a weakened muscle can be made strong by suitable treatment and so increase its activities, but medical science, thus far, has not discovered any method whereby dead or absent muscle tissue can be brought to life and made to function in a normal way. So let us start with the assumption that each human being is endowed with a certain fixed amount of acting brain tissue. This gives each individual a definite measurable quantity of mentality that cannot be increased. This mentality, however, can be left idle or can be decreased by disease or accident during the period of life.

From these statements the following conclusions must be drawn: The child at birth has the same amount of living active brain cells as it will have when grown to adult age. During the time intervening from birth to adolescence these brain cells are stimulated and exercised until they function at their greatest power. The intelligent child at six will not be the dullard at sixteen, barring disease or accident that may cause definite or obscure organic lesions. The dullard at six will be the dullard at sixteen come what way. Bearing this in mind let us for the present, until medical science shows more specific methods, treat these various mental retardations and defections by means that will bring the best results for the individual and the general public. The problem now for consideration is the best form or method of treatment for the retarded or the defective child.

At what age can we detect any subnormality of mentality of any considerable degree? Usually unless the retardation is extreme the knowledge is unfortunately concealed unwittingly until the child goes to school. And even then, because of our present day methods, if the child is of a pleasant disposition and not marked by any of the stigmata of degeneracy it may escape notice until considerably older. Or in the higher strata of society where private tutoring is substituted for school the knowledge of the child's inferiority may not be known

until adolescence. Therefore, I suggest that all children should be examined and their mental capacity ascertained at the age of about five or six for in the treatment of the retarded or defective child the earlier started the better.

In contrast to the good that can be done we must consider what will become of the children of low mentality if the proper steps are not taken immediately for treatment and care. Offhand, I dare say a great many of these children will be public, social or moral menaces. The majority will help keep up the number of inmates in the prison, the poorhouse, and other public and charitable institutions. They will propagate species of as low or lower mentality, potential criminals, aments and dements.

We know that there is a definite curve of distribution in mental capacities, as has been shown by

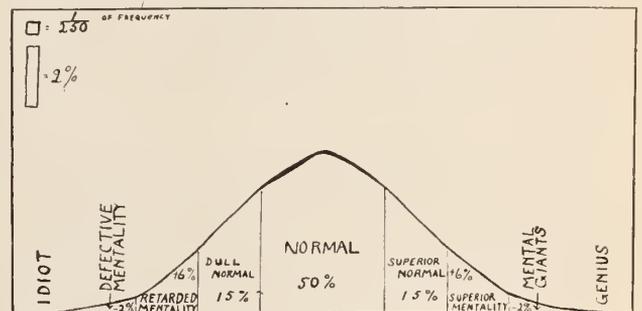


FIG. —Chart showing approximate frequency of various degrees of mentality.

the extensive examinations made by army psychologists and educators, the highest and greatest portion of the curve representing the average normal human being with regard to mentality. This curve descends gradually from either side of the highest point to the genius on one side and the idiot on the other.

The accompanying diagram shows as near as possible the true relationship of the various degrees of mentality to each other and the approximate frequency. The midsection of the curve represents the normal group with the dull normals on one side and the superior normals on the other. The next right side section represents the superior mentality and then the mental giants running to genius. Correspondingly on the left of the dull normals we have the group of retarded mentality and then the defective mentality running down to the idiot.

Having been unsuccessful in our attempts to treat the individuals falling in the lowest two groups (almost ten per cent. of the children) by means of glandular therapy, under the assumption that they were suffering from some disturbance of their endocrine system, let us devote our time and expend our energies in believing for the present that these individuals are normal mentally as one

of that specific group. To illustrate my meaning, let us suppose that a ten year old child has a mental age of seven years. We would then call that child a normal seven-ten child or in terms of intelligent quotients a normal of 70 I. Q. child, all other things being equal. This in spite of the fact that medically we have heretofore termed the child mentally defective or feeble-minded or retarded or whatever term might have been used by the diagnosing physician before starting on a more or less lengthy attempt to cure or improve by means of the glandular extracts, only to be disappointed except in cases of cretinism. Now should this child be a social defect then we would term the child a seven-ten social defect or a 70 I. Q. social defect. And again a physical defect, glandular defect (cretin), or neurotic, moral or any other defect as the case may be.

This tells us the true defect and the treatment can be given in accordance. In other words it is more important to treat the defect whenever present and not the mentality which may be normal for that individual. The aim of the treatment would then be to make the children able to care for themselves totally or in part in after years.

To do this these children must be examined thoroughly both medically and psychologically at an early age and at periods varying from six months to a year. All their physical, social, neurotic and other defects must be noticed and the future treatment be governed by the findings. Their temperament and physical possibilities must be studied for ultimate use.

With the knowledge thus gained and knowing that all these children have a definite capacity for learning, steps can then be taken to lessen their great handicap by means of training in suitable schools or institutions and the utmost done to educate them to the fullest of this capacity, bringing out any latent or potential powers or individual asset, all methods bearing on the one theory of making these children self-supporting in whole or in part in adult life.

The best asset is a sound body and too much stress cannot be placed on the importance of maintaining the good physical qualities that a child has or improving the condition of those not so normally endowed. Variability of mentality is great, as shown by the diagram, but the variability in manual ability is small, therefore attention must be paid to the physical possibilities in order to make up for the handicap of a low mentality.

Not being an educator I will suggest only in a general way the proper methods to school and train these children. First of all there must be special or individual schools for these children so that they themselves may not be imbued with the idea that they are abnormal in some unknown way, as is so often the case among these children who attend schools of the modern system. Special schools should be provided for the training and education of these children who are not up to par mentally, compared with the average child. These mentally subnormal children should be graded both according to mentality and to age. A fifteen year old boy will find no incentive in working alongside of an eleven year old boy, even though they have the same mental capacity. Special subdivisions or departments should be made in the various grades to train or treat any defects that may be found existing in individual cases, such as physical, social, moral, or other defects.

The training and treatment should go to the home by means of social workers wherever needed, and where the home is not conducive to proper training or treatment, due to parental indifference or antagonism, the child should be cared for in an institution.

If these suggestions are followed out and too much of the child's time is not wasted by attempting to bring about a cure or even a betterment by means of glandular therapy in the child's pliable years, much will be accomplished and a far greater percentage of these children of low mentality will be able to become entirely or partially self-supporting.

Chronic Effects of War Gassing

Notes on the Examination of 1200 Cases

By Z. I. SABSHIN, M.D.,
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The lethal gases have played an important rôle in the recent European war. From the military viewpoint it proved to be an efficacious agent, throwing thousands out from the line of active duty, and, while on one hand it might have made the impression of being comparatively humane, it has nevertheless proved to be the cause of many of the disabilities of the American expeditionary force. From my own experience in handling exservice men who applied to the government for compensation, although with no definite statistical data, I may state that about thirty-five per cent. of all the disabilities are traced back to the gassing, with or without other injuries. In taking the histories of these patients I

learned that many of them were not directly gassed in the front lines, but were affected by handling the clothing and other articles of those who were gassed, or by contact with munitions that were in the vicinity of the gassing.

The immediate and early symptoms of gas poisoning are well known to those who were overseas. Although the chemical composition of the gases varied, some of them affecting mostly the lung tissue (phosgen), while others affected every tissue with which they came into contact (mustard), the usual case, however, was a picture of an inflammatory reaction of some part, or the entire respiratory tract. It seems that all the gases are respiratory

irritants, and, judging from the physical findings later on, they have also had an escharotic action upon the lungs. The chronic effects, however, are not confined to the respiratory tract only. We find that every system of the body, as well as the special senses, were disturbed, though some may be considered as complications. The usual complaints given by the patients, whom I have seen from a few months to two years after having been gassed, were as follows: cough, pain in chest, dyspnea, fatigue, dizziness, palpitation, vomiting, indigestion, impaired vision, headaches, aphonia, and nervousness. The first important fact noted from the examination and reexamination of these patients is that the gassing was either a mild one, or of a severe nature. On the one hand, I found marked bronchial disorders a few months after the exposure to the gas, and have seen these same cases fully cleared up several months thereafter. On the other hand, I noted the persistence of the abnormal subjective and objective findings, even over two years after the gassing. The pathology of this latter group of cases is not very clear, and one is likely to change his opinion on examination and reexamination of these patients.

The first phenomenon that attracted my attention was the occurrence of chronic pulmonary tuberculosis in these patients, and I have wondered as to what may be the relation of war gas to pulmonary tuberculosis. I have asked this question of one of the older men in the army service, and his answer was that the tubercle bacillus was killed by the gas, and hence gassing did not cause tuberculosis. I could not contradict this statement, and was puzzled, as my list of chronic pulmonary tuberculosis in the gassed exsoldiers was growing larger. The next group of cases with a peculiar morbid anatomy from the causative point of view is the one with typical subjective as well as physical findings of bronchial asthma. I do not know to which of the existing theories as to the cause of asthma gas poisoning can be added. The fact remains that the war gassing did cause bronchial asthma. Not less interesting, and at first more mysterious, is the group of cases with chronic cardiac disorders. Here are cases with all signs and symptoms of a valvular lesion, regurgitation, stenosis, or both, with no history of rheumatism or any other known cause of heart disease, and the trouble starting from the day of the gassing. There are other cases with tachycardia as the only finding, some of which resemble greatly a clinical picture of hyperthyroidism, and may be easily mistaken as such in private practice.

I have mentioned these groups of cases because of the puzzling relation of the cause to the pathological sequelæ. The bulk of my cases, however, were recorded as chronic bronchitis. In some we have added the term emphysematous type, in others asthmatic type, disregarding the terms mild or severe, which were often used. All these cases came in with the chief complaint of cough and shortness of breath. The physical findings were the usual signs of a bronchitis. The peculiar feature is the marked roughness of the breath sounds, mostly found in the interscapular region. In some cases this type of bronchial breathing resembles actual sawing of wood, while percussion would give nearly

normal findings, with or without other auscultatory abnormalities.

The etiology accounting for the form and progress of all the chronic disorders mentioned above is only a matter of speculation. The first thing the gas does is to irritate the lung tissue, thereby causing an inflammation. Associated with that there may also be deep-seated necrosis of the parenchyma, which later probably heals by fibrosis, thus accounting for the roughened respiration. The inflammatory process in some cases is accompanied by the development of fluid in the alveoli, and violent coughing, caused by the irritation, results in the destruction of the alveolar epithelium and bursting of the air vesicles, thus developing a disruptive emphysema. With the edema and congestion of the lungs there is also probably some thrombosis, slowing up the pulmonary circulation, causing an oxygen deficiency in various systems and organs, and in turn, sooner or later, leads to a disturbance in the right heart. There may also be some changes in the concentration of the blood, which, together with the lack of oxygenation, causes changes in the cardioaugmentory and cardioinhibitory centres, thus accounting for the cardiocirculatory disorders. The gas most probably is absorbed through the lungs into the system and causes the general symptoms. Destruction of the lining of the respiratory tract predisposes to invasion of the lungs by bacteria from the mouth, so that a tuberculous process can be easily started. The lowered resistance is also demonstrated by the fact that influenza occurred about twice as often in the gassed soldiers, as compared with those who were not gassed. Contrary to what one might expect, it seems that the negro had a greater resistance to the gas, as seen from the comparatively milder symptoms in this class of patients.

As stated above, the bulk of my cases were those of chronic bronchitis. It may, however, be of some interest to copy some of the figures from my record, which I do not consider of any statistical value. I have had 104 cases of chronic pulmonary tuberculosis, fifty-four with bronchial asthma, forty-eight with chronic valvular disease of the heart, thirty cases of tachycardia, twenty-two cases of chronic myocarditis, twelve cases of chronic nephritis, six of neurocirculatory asthenia, and eight cases of chronic gastritis with or without dysentery. The special senses in my cases were affected as follows: Sixty-eight had chronic conjunctivitis, four had retinitis, twelve had chronic otitis media, twenty-three cases of chronic laryngitis. Eighteen were diagnosed as suffering from neurasthenia. From the histories I also learned that fourteen were blind from one to four weeks after their having been gassed, one had loss of speech for five months, one still has loss of smell, and two have lost the power of erection.

The practical question which faces the community as well as the government is the extent of permanent injury and the period of disability of the gassed soldiers. From this point of view this question proves to be much more complicated than it was originally believed.

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Editorial Articles

DIPHTHERIA

Professor Schick's article on the Predisposing Factor in Diphtheria, which appears on page 197 of this issue, commands special attention, both an account of the eminence of its author and the importance of the subject. The very greatness of the accomplishment reminds us forcibly how much remains to be done before we can interpret with any degree of certainty even those phenomena of infection which are easily observed and of common occurrence. The author refers to the early struggles of the young science of bacteriology against the ever alert powers of darkness. This remark serves as a useful reminder of the fact that many of our basic truths were only yesterday held to be fantastic heresy. We need only refer to the fight that centred around the present conception of immunity and the phenomenon of bacterial carriers.

Diphtheria has lost much of its element of dreaded terror since the advent of specific serum therapy. It is well to remember, however, that the disease is not as harmless yet as many observers who do not come into close contact with it may be led to believe. It is left to pediatricists and the hospital staffs to realize to its full extent the peculiarly treacherous character of the affection.

The case incidence of diphtheria in New York city reached its recent climax of 433 cases in the week of April 30th. This was by far the highest figure shown by any individual disease during that period. On July 23rd the incidence had dropped to 136, while the mortality amounted to nine cases during the week, which represents one per cent. of all deaths. Though the death rate of laryngeal infection is no longer ninety per cent., we still find the worst features of diphtheria in this variety. Holt estimates the mortality of laryngeal diphtheria at forty per cent., while many English observers place it even at fifty per cent. and over. If we conclude this short survey with a reference to cardiac and nervous sequelæ, we will have succeeded in emphasizing the undiminished urgency of combating diphtheria.

In his present paper Professor Schick gives us an interesting outline of the early history and later development of the intracutaneous test. He also indicates the gist of the theoretical considerations and some of the experimental work which form its scientific basis. In discussing natural protection against infection emphasis is laid on the mechanical factor, while no special reference is made

to the defensive forces centred in the vital processes of cell function. One may wonder if a more active share in the defense of the body should not be attributed to the cells of the pharyngeal mucous membrane, rather than to the mechanical structure of the tissues. The author mentions an instance, where trauma broke down the efficiency of the mucosa and an attack of diphtheria resulted in a carrier after a tonsillectomy had been carried out. Is not the process identical in the type frequently met with in clinical practice, where an acute non-specific tonsillitis is followed after an interval by an attack of true diphtheria? We need only presume that the onslaught of the first variety of organisms, the shock troops, damaged the previously healthy epithelium in such a way that the originally powerless diphtheria bacilli found a suitable soil in the now devitalized tissues. MacCallum's *Textbook of Pathology* contains an interesting photomicrograph showing an advanced line of streptococci actually within the tissues of the pharynx, while diphtheria bacilli have gained a footing on the more superficial necrotic portions. Though other explanations cannot be altogether ruled out, it may be admitted that it has all the appearance of a case of genuine symbiosis. In any case, the fact that the mucosa becomes damaged in the course of diphtheria, makes it highly probable that absorption of toxins of other than diphtheritic origin does actually take place. This is a possibility which seems to us worthy of more consideration than has hitherto been accorded to it.

Schick has forged a weapon which enables us to attack diphtheria from many different points of vantage. For the first time we are able to determine the susceptibility of large bodies of individuals with speed and accuracy and within the bounds of economic possibilities. It is, perhaps, with justifiable pride that we point to the progressive spirit our health department has shown in quickly appreciating the potentialities of the test and in utilizing it on such a large scale without courageous enterprise. The good results obtained in New York city are due to a great extent to the wise publicity service which has widely diffused a knowledge of the merits of the test. We remember with admiration the public spirited demonstration given at the recent New York State Medical Society exhibition in Brooklyn.

Schick's test has confirmed the findings of clinical observation with regard to the dangerous age. Children between the ages of six months and six years

show the greatest susceptibility. The author points out that in at least one important point the test is superior to bacteriological examination: this is the decision, whether a carrier of diphtheria bacilli in whom tonsillitis develops, suffers from a superimposed acute attack of diphtheria, or whether he continues to be resistant to the specific organism and merely has a septic sore throat. In the latter case, the bacteriological examination would indeed show the presence of Klebs-Loeffler bacilli, but Schick's test would be negative and thus reveal the true state of affairs. Again, during an epidemic of diphtheria in an institution, such as a school or a hospital, there would be no need to inflict the annoyance inseparable from a course of serum immunization, on those individuals who are naturally protected, as demonstrated by the Schick test. Finally, we may point out that the test has been and to an even larger extent in the future will be an important help for researches into the nature of immunity and infection. The test has added another triumph to the fair fame of Æsculapius's youngest daughter, Prophylaxis. It also is endowed with a special attraction, inasmuch as it stimulates the development and rewards the public spirited application of a rare and precious faculty of the mind of man—foresight.

PEDIATRICS AND OTHER THINGS.

This issue of the *NEW YORK MEDICAL JOURNAL*, as well as that of August 3d, is devoted to papers on the subject of pediatrics. Many of them will be found useful and most of them present new findings or shed more light on things known but not always emphasized.

The mental and nervous factors are among the most important considerations in the study of child life. The conditionings of the first few years of childhood, as shown by the studies of Freud, Hug Helmuth, White, and other workers are the most important in the entire life cycle of the individual. We have always attempted to be fair and publish papers by men of standing even though we did not agree with them. In this instance, we publish a reactionary paper by Dr. Charles W. Burr, of Philadelphia. He has either ignored or failed to keep up with the literature on the subject. It would be well if he would get in touch with the works of Jones of England, Hug Helmuth of Germany, and Kempf and White of America. He would then secure a better understanding of the causative factors in the behavior of children. The great difficulty with Dr. Burr is that he only observes things on the surface and never gets down to fundamentals. He classifies children into groups. He for-

gets that they are individuals with a personality in the making. He accepts them as they are and attempts to label them. It is depressing to find workers holding positions of prominence clinging to dogmas long since relegated to limbo, calling the brain "the great organ of thought and feeling" when we thought that this scholastic point of view had been abandoned even before James and Lang had put forth their theories. The author frequently naively seeks answers for questions which are no longer mysteries except to those who refuse to see: ". . . whereby new potentialities whether for evil or for good arise, we do not know." It would be more accurate if the personal I were substituted for the more amorphous editorial we, for there are workers in this important field who do know, and who base their therapy upon their knowledge. We would not attempt to say that psychoanalysis would have improved the products of Dickens, but we do feel that a better understanding of human behavior would materially improve Dr. Burr's concepts of the nervous child. His therapy consists of repression, repression of the things that should be brought to light and examined and then synthesized, but it is difficult to do this when the physician himself is groping about and has lost contact with reality. Dr. Burr's paper, however, is not wholly bad. One statement in particular is extremely well put—"We must relearn that innocence, which after all is ignorance, though pretty in a baby, is hideous in an adult; that hiding nasty truths does not make them untrue or abolish them and that work is the one thing worth while." This is sound common sense, and it does not seem to be in keeping with most of the reactionary parts of the paper.

VACCINATION METHODS

The average physician regards vaccination as more or less of a nuisance—an unimportant task to be relegated to the office nurse or to be hurriedly performed by the doctor himself with a prayer that a bad arm may not follow. As a rule, the patient's family does the afterdressings according to their several lights, and if the vaccinee goes to school a certificate of vaccination is issued if any sort of a scar results. There is no generally followed vaccination technic, some scratch, some bore, and some squirt the vaccine beneath the skin with a hypodermic syringe. There is no universal site for vaccination; the deltoid insertion, right or left, the inner aspect of the arm, the calf and the thigh being used alike. There is no definite rule regarding revaccination; no uniform method of diagnosing a "take," an immune reaction, or a failure. In other words, by

and large the practicing physician is neglecting a tremendously important public health duty.

This results, perhaps, from the fact that the average practitioner sees few cases of smallpox, and those which come to his attention are generally benign. Hence, unconsciously, smallpox has come to be regarded as an almost negligible danger. Yet mild smallpox is pretty generally distributed throughout the United States and if physicians continue their present vaccination technic we are likely to see a good many old fashioned virulent cases. Certainly, improperly performed vaccinations do not help the cause of vaccination; one bad arm in a community will undo a year spent in carefully teaching public health, and furnish the conscientious objectors of that neighborhood with a telling argument.

It is up to the health authorities to lay down a standard of vaccination technic and to define accurately what is a "take," an immune reaction, or a failure. This standard should be nationwide in its application, and once promulgated should be enforced by the local health organizations. For years the Public Health Service has safeguarded the purity and potency of smallpox vaccine. Could it not with equal propriety standardize vaccination methods?

PHYSICIAN AUTHORS: DR. JOHN MOORE

When Dr. John Moore, the father of Sir John Moore, (hero of the Battle of Corunna, immortalized in Charles Wolfe's poem, *The Burial of Sir John Moore*) wrote his first novel, *Zeluco*, he issued this warning to the public: "Tracing the windings of vice and delineating the disgusting features of villainy are unpleasant tasks, and some people cannot bear to contemplate such a picture. It is fair, therefore, to warn readers of this turn of mind not to peruse the story of *Zeluco*." This warning, we are told, was issued in all sincerity, though if a similar warning in connection with a novel were issued today one would be justified in suspecting its purpose. At any rate, human nature in those days (1789) was no different from that of today, and so the warning was not heeded. Instead, *Zeluco* instantly became a best seller. It ran through several editions in England and Ireland and was translated into French. Then, like many another best seller, it sank into oblivion. Critics say that, as novels go nowadays, it was a pretty dull story and generally defective as a piece of literature. But although *Zeluco* was a third rate product, it has, as Thomas Spencer Baynes points out in the *Encyclopedia Britannica*, left an abiding mark on English literature through Byron's *Childe Harold*, which was in-

spired by *Zeluco*. "The character took great hold of Byron's imagination," says Baynes, "and probably influenced his life in some of its many moods, as well as his poetry. It is not too much to say that the common opinion that Byron intended *Childe Harold* as a reflection of himself cannot be cleared of its large mixture of falsehood with a study of Moore's *Zeluco*. Byron said he intended the *Childe* to be 'a poetical *Zeluco*,' and the most striking features of the portrait undoubtedly were taken from that character. At the same time it is obvious to everybody acquainted with Moore's novel and Byron's life that the moody and impressionable poet often adopted the character of *Zeluco*, fancied himself and felt himself to be a *Zeluco*, although he was at heart a very different man."

Mr. Baynes is one of the few latter day admirers of Dr. Moore's fiction. "In these days," he says, "*Zeluco* would be called a psychological novel; it is a close analysis of the motives of a headstrong, passionate, thoroughly selfish and unprincipled profligate. It is full of incident and the analysis is never prolonged into tedious reflections nor suffered to intercept the progress of the story, while the main plot is diversified with many interesting episodes." Dr. Moore wrote two other novels, *Edward* and *Mordaunt*, and several other books. *Edward*, in two volumes, and *Mordaunt*, in three, were both dull stories and neither as successful as *Zeluco*. Dr. Moore intended *Edward* to illustrate the admirable side of life, the reverse of *Zeluco*. George Saintsbury, one of the ablest of present day critics, says Moore's novels "lacked concentration and finish, and he is likely never to be read again as a whole."

Moore's first book was his *Views of Society and Manners in France, Switzerland and Germany* (two volumes), published in 1779, after he had spent five years on the Continent with Douglas, eighth Duke of Hamilton, who was in poor health. He followed this with two more volumes of *Views of Society and Manners in Italy* and in 1786 he published *Medical Sketches*, in two parts. The first part is physiological and its most original remark (says Norman Moore in *The Dictionary of National Biography*) are on the reflections and impressions from one nerve to another, illustrated by the fact that eating ice cream gives pain at the root of the nose. The second part treats, but with no great clearness, of several varieties of fever. Moore also wrote two volumes on the French Revolution, of which he was an eye witness, having gone to France in 1792 with the Earl of Lauderdale. He saw the disturbances of August 10th and the massacres of September 29th, and many other features of the revolt. His account of these events is set down in his *Journal During the Revolution in France from*

August first to December 15, 1792. The *Journal* appeared in two volumes, in 1793 and 1794, and was followed by two volumes entitled *A View of the Causes and Progress of the French Revolution*. Carlyle quotes Moore frequently in his history of the French Revolution, despite the fact that he disparaged Moore's reportorial ability. "As an author," says Carlyle, "Dr. Moore was more distinguished by the range of his information than by its accuracy or extent upon any particular subject, and his writings did not owe their celebrity to any great depth or originality of thought. . . . As a novelist he showed no extraordinary felicity in the department of invention, no great power of diversifying his characters or ease in conducting his narrative." Moore's other literary work included a biography of his friend, patient, and fellow physician, Dr. George Tobias Smollett.

Dr. Moore was born in Stirling, Scotland, in 1729, and was educated first at the Glasgow grammar school, after which he entered Glasgow University and at the same time was apprenticed to Dr. John Gordon, the surgeon to whom Smollett also was apprenticed. Beside attending the medical courses at Glasgow University he devoted himself to the study of literature, history, and philosophy. At the end of his apprenticeship, in 1747, he was made a surgeon's mate in the Duke of Argyll's regiment and saw considerable service on the Continent. After peace was declared he attended Dr. William Hunter's lectures in London, then went to Paris to continue his medical studies, returning to Glasgow in 1751 to become Dr. Gordon's partner. On his way from Paris he attended another series of Hunter lectures and took a course in midwifery. He practised two years with Gordon, and then with Hamilton, the professor of anatomy, but it was not until 1770 that he obtained his M. D. degree at Glasgow University. It was two years later that he started on the five year tour of Europe with the Duke of Hamilton. Upon his return to England he resumed practice in London. After many years' practice his health broke down and he went to live at Richmond, Surrey, where he died on January 21, 1802.

"Dr. Moore was sagacious as a physician and throughout his life had intense enjoyment in general observation and in every kind of good literature and good society," says Norman Moore (in the *Dictionary of National Biography*). "He was universally liked and most of all in his own house. He was well built and had regular features. Sir Thomas Lawrence painted his portrait and there was another portrait of him with the eighth Duke of Hamilton and Sir John Moore (his son) by Gavin Hamilton."

DEATH RETURNS

The examination of the mortality records of a community is not the most pleasant pursuit from a general point of view, and it is certainly not encouraging to one who has the progress of medical science and the advancement of health at heart. We do not refer here to errors as to "cause of death" nor to that always confusing "contributory," "secondary" or "intercurrent" factor in the taking off of the deceased. The former is too often puzzling and we must confess that we sympathize with anyone who becomes confused by these latter terms and have been longing to have someone render them lucid or replace them by a word or phrase of better defined meaning. One might find fault with the continued use of the expressions heart failure, debility, old age, and many others, if they were not such convenient and expressive terms and did not so readily cover our clinical ignorance. It is not so easy to give, instead, the name of a "definite disease" demanded by the registrar.

While the cause or causes of death should be given as carefully as possible we all have good reason for not always knowing just what brought the human motor to a stop. We seldom, however, have an excuse for not knowing the occupation and the exact occupation of the deceased. Moreover, when we fail to give these it is plainly evident, not only that we are not interested in, and do not comprehend, the full purpose of vital statistics, but it reveals the fact that we never made a thorough study of the case.

Occupation (or lack of it) is perhaps the greatest factor in the welfare of the human machine, and one cannot go too carefully into the work done by a patient and the conditions under which he works. It is not enough to know that a man labors in a factory, or that he is employed in a factory producing a certain product. There may be a dozen special occupations in this business with as many sources of wear and tear to the organism. It is not sufficient to ask a man where he works or in what department. He should be pinned down to the exact process he carries out and, if the lead seems at all promising, to an exact account of the materials and methods employed. It is of no use in diagnosis and of no service to statistical science to be able to place on the death certificate merely that the deceased was a carpenter or a musician or a painter. Without specification the student of certificates does not know whether the first stooped all day over a lathe in a dusty room or built houses, whether the second conducted an orchestra at ten thousand dollars a year or turned the crank of a hurdy gurdy, or whether the third was a prosperous landscape artist or a

worker in the lead laden atmosphere of some paint shop. Nor is it of any use to anyone to say that the decedent was retired, further than that retirement from work is often a dangerous procedure. If retired, retired from what? He might be a retired printer or a retired preacher. There is considerable difference when it comes to tracing and eradicating sources of occupational menace.

It is of great importance to be as exact as possible in giving the causes of death, but, with the exact occupation preceding death or for the major portion of life given, the death certificate becomes of far greater statistical value. Without this information it is of comparatively little use except for collecting insurance. The physician has no excuse for not making the death certificate a valuable document.

CHILD LABOR IN WISCONSIN.

Children in Wisconsin who are compelled to work have a distinct advantage over their young fellow toilers in other states, according to data set forth in the Biennial Report of the Industrial Commission (1918-1919), recently issued. All occupations except agriculture are covered by the child labor law of the state. Not only are working children thoroughly supervised, but those found physically disqualified are given medical service at nominal cost. Below fourteen years of age, Wisconsin children are given only vacation permits. Between the ages of fourteen and seventeen permits for regular employment are given on the basis of physical and educational qualifications. Close cooperation with the system of vocational and continuation schools is maintained by the staff of the commission and its agents throughout the state.

NOTICE TO OUR READERS.

The index for Vol. CXIII of the *NEW YORK MEDICAL JOURNAL* will be sent on the request of our subscribers. Those desiring it will kindly write to the editors.

News Items.

Pennsylvania Hospital to Be Enlarged.—The Pennsylvania Hospital, Philadelphia, is having plans drafted for a nurses' home, an outpatient building, a private patient building, a service building, and additions to the heating plant, laundry and laboratory.

New X Ray Tube.—Dr. Julius Lillienfeld, professor of physics at the University of Leipsic, inventor of a new x ray tube, gave a demonstration in the presence of Professor George Pegram and Professor Davis at the Department of Physics of Columbia University and before the New York Röntgen Ray Society. Experiments are being carried on with the new tube at Bellevue Hospital under the direction of Dr. I. Seth Hirsch.

American Chemical Society.—The annual meeting of the American Chemical Society will be held in New York, September 6th to 10th.

Cholera in Russia.—The Moscow authorities have officially admitted 47,779 cases of cholera throughout Russia and have also admitted that the number is on the increase.

Smallpox in a State Hospital.—Ten cases of smallpox were discovered in the State Hospital for the Insane at Waterbury, Vt. A new patient was said to have carried the disease to the hospital. The infected persons have been isolated and the entire hospital is under quarantine.

American Association of Obstetricians, Gynecologists, and Abdominal Surgeons.—The thirty-fourth annual meeting of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons will be held at the Hotel Statler, St. Louis, September 20th to 22d, under the presidency of Dr. Henry Schwarz, of St. Louis.

Reconstruction Assistant.—The United States Civil Service Commission announces an examination for reconstruction assistants in physiotherapy and occupational therapy. The salaries range from \$600 to \$960 a year, and maintenance. Applications will be rated as received until further notice. Applicants should apply for form 304, to the United States Civil Service Commission, Washington, D. C.

Death Rate of New York City.—According to statistics of the Department of Health, the deaths in New York city during the week ending July 23, 1921, were fewer than in the corresponding week of 1920. The figures are 984 deaths, giving a rate of 8.93 in 1,000 of population for 1921, against 9.21 in 1,000 a year ago. For the first thirty weeks of 1921 the death rate was 11.89 in 1,000, against 14.80 in 1,000 in 1920.

One Million Five Hundred Thousand Cancer Deaths.—The League of Red Cross Societies has just issued a report in which it states that in the four years from 1908 to 1912 cancer caused more than 1,500,000 deaths in civilized countries. The country which had the highest mortality between 1900 and 1919 was Switzerland, with 125 to 100,000 inhabitants. Holland and England come next, with about 100 in 100,000. The United States comes after England with a steady tendency toward increase in the number of cancer deaths. Italy has the smallest number of deaths from cancer.

Consultants to the National Pathological Laboratories.—Dr. George Dock, of St. Louis, Dr. Otto Folin, of Boston, and Dr. Ludwig Hektoen, of Chicago, have accepted appointments as consultants to the National Pathological Laboratories, New York. They will specify the methods to be used and keep the laboratories in touch with the most modern advances that will be useful in aiding the practising physician. Problems relating to the application of laboratory service to clinical medicine will be referred to Dr. Dock; Dr. Folin's advice will be followed in problems of blood chemistry and other biological subjects, and questions relating to tissue diagnosis, bacteriological and serological methods will be referred to Dr. Hektoen.

Johns Hopkins Hospital Fees.—The Board of Trustees of the Johns Hopkins Hospital has issued a dictum fixing the maximum fee for an operation in the hospital at \$1,000 and the maximum charge for attending a patient in the hospital at \$35 a week. The ruling applies to only part time professors and their assistants.

New Officers of Medical Association of Montana.—At a recent meeting of the association, the following officers were elected for the ensuing year: Dr. Wyman F. Andrus, of Miles City, president; Dr. Charles F. Watkins, Billings; Dr. Aloysius N. Dolan, Great Falls, and Dr. Percy S. Rennick, Stevensville, vice-presidents. Dr. Elmer G. Balsam, Billings, was reelected secretary-treasurer.

Cosmopolitan Cancer Research Society.—A new research laboratory has recently been formed in Brooklyn to study cancer and disseminate information as to the nature of the disease, its causes, methods of prevention, and treatment. The society will cooperate with federal, state and municipal health departments, hospitals, and all organizations through which education may be extended to the people.

Prevention of Rickets.—A committee was recently appointed in New York for the purpose of ascertaining the prevalence of rickets among children born of Italian parentage, in those nursed exclusively and in those fed artificially; to devise means of preventing rickets by various measures, such as the use of cod liver oil, sunlight and fresh air, diet, hygiene, etc., and to cure the condition after it has appeared. The committee is composed of representatives of the bureau of child hygiene of the New York City Department of Health and the Association for Improving the Condition of the Poor, and among its members are Professor H. C. Sherman, Professor Mary S. Rose, Professor Graham Lusk, Dr. Alfred F. Hess, Dr. Charles Hendee Smith, Dr. Louis C. Schroeder, Dr. Jules M. Blumenthal, Dr. Jacob Sobel, Mr. Bailey M. Burritt and Mr. John C. Gebhart.

Personal.—Dr. George E. de Schweinitz and Dr. John G. Clark, both of Philadelphia, will leave for Peking, China, on August 18th, to attend the installation of the new director of the Union Medical College, founded by the Rockefeller Foundation.

Lieutenant Colonel Harry L. Gilchrist, Medical Corps, United States Army, has been awarded the distinguished service medal for exceptionally meritorious and distinguished service while serving as chief of the delousing and bathing services of the American Expeditionary Forces.

Walter G. Campbell, assistant chief of the Bureau of Chemistry, Department of Agriculture, Washington, D. C., since 1916, has been made acting chief to fill the place of Dr. Carl L. Alsberg, who resigned July 15th. Dr. W. W. Skinner, chief of the water and beverage laboratory of the bureau since 1908, is designated as assistant chief.

Dr. W. C. Billings has been appointed director of inspection of immigrants at Ellis Island. He succeeds Dr. J. W. Kerr, who has been transferred to the Surgeon General's office, Washington, D. C. Dr. Billings has been executive officer twice since entering the United States Public Health Service in 1898.

Suicides in 1921.—In the first six months of the year 1921, there were reported to the Save-a-Life League 6,509 suicides of whom 4,527 were males and 1,982 females. In the first half of 1920, 2,771 suicides were reported in the United States, 1,810 males and 961 females. The average age of the male suicide is forty-three years. Unsettled economic conditions, with loss of employment and business failures, are blamed for the suicide wave which has spread over the country since the first of the year. Two hundred and twenty-five children ended their lives in the first half of 1920; the number has more than doubled this year. The average age of girl suicides is fifteen and of boys sixteen years.

Died.

ABBOTT.—In Brookline, Mass., on Monday, August 1st, Dr. Florence Hale Abbott, aged fifty-three years.

ADAM.—In Jersey City, N. J., on Thursday, July 28th, Dr. Clovis Adam.

BLOCKLINGER.—In Dubuque, Ia., on Wednesday, July 20th, Dr. Albert Herman Blocklinger, aged fifty-four years.

BROWN.—In New York, on Friday, July 29th, Dr. Helen Williston Brown, aged thirty-seven years.

BROWN.—In Parkersburg, W. Va., on Sunday, July 24th, Dr. Robert L. Brown, aged sixty-six years.

BRYANT.—In Berkeley, Cal., on Saturday, July 16th, Dr. John Bryant, of Independence, Mo., aged seventy-six years.

BURGIN.—In Philadelphia, Pa., on Sunday, July 31st, Dr. George H. Burgin, aged sixty-seven years.

CROSTHWAITE.—In Altoona, Pa., on Monday, July 18th, Dr. David Wilmot Crosthwaite, aged sixty-four years.

CROSTON.—In Haverhill, Mass., on Saturday, July 30th, Dr. John F. Croston, aged sixty-six years.

GRAY.—In New York, on Saturday, July 23rd, Dr. Herbert L. Gray, aged thirty-nine years.

HICKS.—In Mobile, Ala., on Monday, July 18th, Dr. Lamartine O. Hicks, of Jackson, aged seventy-two years.

HURLOCK.—In Philadelphia, Pa., on Sunday, July 24th, Dr. Frank I. Hurlock, aged sixty-two years.

LOMISON.—In Mt. Carmel, Pa., on Monday, July 18th, Dr. William A. Lomison, aged seventy-four years.

MCCAY.—In Sunbury, Pa., on Thursday, July 28th, Dr. Mary Anne McCay, of Northumberland, aged sixty-four years.

MOON.—In Philadelphia, Pa., on Sunday, July 24th, Dr. Rachael Tatnall Moon, aged forty-seven years.

MOORE.—In New York, on Sunday, July 31st, Dr. Edwin W. Moore, of San Diego, Cal., aged seventy-three years.

MUSGRAVE.—In New York, on Sunday, July 31st, Dr. Christopher James Musgrave, aged forty-six years.

SELDEN.—In Troy, N. Y., on Sunday, July 24th, Dr. Robert Selden, of Catskill, N. Y., aged seventy-three years.

SIMS.—In Memphis, Tenn., on Thursday, July 14th, Dr. Samuel C. Sims, aged fifty-nine years.

SMITH.—In Kingston, N. Y., on Saturday, July 30th, Dr. George De Forest Smith, aged sixty-nine years.

SWINBURNE.—In Rye, N. Y., on Saturday, July 23rd, Dr. George Knowles Swinburne, of New York, aged sixty-three years.

TODD.—In Cleveland, Ohio, on Sunday, July 17th, Dr. Frank H. Todd, aged seventy-two years.

TOOMBS.—In Lexington, Ky., on Friday, July 15th, Dr. R. Saunders Toombs, of Memphis, Tenn., aged seventy-seven years.

ULLRICH.—In Brooklyn, N. Y., on Wednesday, July 27th, Dr. Robert Matthew Ullrich, aged forty-six years.

VANDERHOOF.—In Phelps, N. Y., on Friday, July 29th, Dr. Frederick D. Vanderhoof, aged seventy-eight years.

WESTFALL.—In Dresserville, N. Y., on Sunday, July 17th, Dr. Helen M. Westfall, aged seventy-one years.

WHITESIDES.—In Indianapolis, Ind., on Sunday, July 17th, Dr. Lindsey L. Whitesides, of Franklin, Ind., aged sixty-one years.

WOOFER.—In Centralia, W. Va., on Wednesday, July 20th, Dr. James Vernon Woofler, aged forty-five years.

THE SYRACUSE CLINIC.

BY C. E. COON, M. D.,
Syracuse, N. Y.

Much has been said about group medicine since the close of the World War. During the conflict it became apparent that free collaboration of two or more specialist physicians brought quicker and happier results to all concerned. The immense amount of progress in each subdivision and redivision of medicine has rendered the individual specialist capable of correctly handling only a certain proportion of cases, and apart from medical advancement the conclusions of several men are less likely to be in error than those of a single practitioner.

Loose forms of group medicine have been practised for years, such as the calling of consultations, so-called hospital clinics, ward work, and in other apparent ways. Group medicine in the true sense

general surgery; Dr. T. H. Halsted and Dr. F. J. O'Connor, otolaryngology; Dr. A. C. Durand, ophthalmology; Dr. S. P. Richmond, dermatology; Dr. T. F. Laurie, genitourinary surgery; Dr. N. P. Sears, gynecology; Dr. C. E. Coon, orthopedic surgery; Dr. J. H. Burch and Dr. F. C. Rulison, roentgenology, gastroenterology, radium and electrotherapy; Dr. A. B. Siewers, neuropsychiatry; Dr. H. G. Locke, consultant neuropsychiatrist; Dr. O. W. H. Mitchell, consulting bacteriologist; Dr. R. K. Brewer, consulting chemist; Miss Mary B. Cooper, A.B., in charge of the laboratory. To these will be added other special departments and a dental diagnostician and surgeon will be included. Thus all the important departments of medicine and surgery and the specialties are represented.

A graduate of the Nitchi School is instructor in the teaching of lip reading for the deaf, and a competent instructor is in charge of corrective gymnas-



FIG. 1.—Syracuse Clinic, Fayette Park, Syracuse, N. Y.

implies much closer association, preferably all housed under a single roof and in more or less legal affiliation with one another. Thus there may be liberal use of one another's time and apparatus to the single end of securing an accurate, quick, and less expensive diagnosis. It is the most practical manner of making use of the principles of collaboration, and opportunities for research are afforded that do not obtain in individual practice. The Mayo clinic stands out as a testimonial of the truth of this statement.

The Syracuse Clinic is an association of physicians for the practice of group medicine. The partnership consists of Dr. T. H. Halsted and Dr. C. E. Coon, with fifteen physicians comprising the active staff of the clinic. They are as follows: Dr. W. A. Groat, Dr. E. V. Sweet, and Dr. C. E. McElwain, internal medicine; Dr. A. G. Swift and Dr. P. K. Menzies,

tics. A trained mechanic is in charge of the shop for the construction of various orthopedic devices. A force of trained nurses, secretaries, stenographers and a trained librarian complete the staff.

The site of the Syracuse Clinic building is an excellent one, on Fayette Park, close to the business centre of Syracuse. The colonial type of the structure adds dignity to its purpose. There are three large floors and a well lighted basement. A spacious reception hall on the main floor serves as a common waiting room and in addition to this the two corridors serve as waiting rooms. The offices are large and provide ample space for greater facility in work. The equipment of the various departments is very complete and in keeping with the latest advances in medicine.

In the x ray room various screens, filters and grids are constantly in use to improve the quality

of the picture work and there are offices equipped for the use of diathermy, high frequency, and other electrotherapeutics. A quantity of radium is owned by the clinic and its use is directed by an experienced physician. The examination rooms and operating room are tiled. The medical section is, of course, the largest, having six connecting offices. In this department there is also a room for the study of basal metabolism by the Benedict method. The large laboratory is completely equipped for clinical and research work. The well supplied library is a most useful room and in this daily consultations are held on the group and other cases following luncheon in an adjoining room.

GENERAL DESCRIPTION OF THE METHOD PURSUED
BY THE CLINIC IN THE DIAGNOSIS OF DISEASE
AND THE TREATMENT OF PATIENTS.

Diagnosis is the foundation of treatment. Effective treatment depends upon accuracy of diagnosis.

The majority of persons requiring medical treatment are suffering from some disease of a definite



FIG. 2.—General waiting room of the Syracuse Clinic.

nature, the diagnosis of which may be made by one physician or specialist. This class of patients may not need an exhaustive examination and it may not be necessary for them to be examined or treated by more than one physician. In this case the method of procedure is exactly as if the patient were consulting any competent doctor.

In the more complex cases, however, every available means of investigation may be required to reach a diagnosis. Various special tests and examinations are usually necessary and the services of a number of physicians, representing different specialties, the laboratory and x ray, all working in collaboration, may be needed before the nature and cause of the disease or affection can be made clear, in which event the method known as group diagnosis is employed. Briefly this method is as follows:

A comprehensive history of the patient's complaint is taken by the physician making the first examination, after which the patient is seen by such specialists as are required to examine the case. Laboratory tests of secretions, excretions, blood and the necessary x ray examinations are made. Written reports

of the findings of the different specialists and departments are furnished to the physician of the group having the case in charge. Following this, consultations of the doctors especially concerned in the case are held, and an opinion or diagnosis is reached.

After the examination is completed, if the patient



FIG. 3.—Laboratory of the Syracuse Clinic.

has been referred to the clinic by an outside physician for diagnosis alone, the patient will be returned to his own doctor with the opinion and advice of the clinic. If he has come for treatment he will be referred to the proper specialist for treatment of his particular case.

The organization of the clinic, then, is such that a patient may have to consult but one physician and be examined or treated by him alone, or the services of as many physicians as may be needed in any given case may be utilized for either diagnosis or treatment. The patients requiring hospital service are sent to one of the hospitals of the city with which the physicians of the clinic are connected.



FIG. 4.—Orthopedic shop of the Syracuse Clinic.

Periodical health examinations for the purpose of discovering early tendencies to disease or its presence are undertaken by the clinic, there being a very definite demand by persons, especially those over forty years of age, for the character of medical examination known as life extension service.

The expense to any patient will, of course, vary in accordance with the amount of time, labor, care and material expended. Patients consulting one doctor only would pay the ordinary fee charged by a specialist for similar services. In more complex cases, requiring group diagnosis, there is conservation of time, easy collaboration of the specialists, and unity of control. A single bill, which includes the services of the various physicians engaged in any given case is rendered by the clinic and not by the individual doctor. A flat fee is charged for group diagnosis and life extension examinations, while for treatments or surgical work the fees depend upon the work performed.

LONDON LETTER.

(From our own Correspondent.)

LONDON, June 11, 1921.

The Hospital Crisis—Sir James Cantlie on Tobacco—Notification of Venereal Disease—Maternity Endowment—Physical Education in Schools.

This unfortunately is a time of crises, of unwonted happenings, and like industry the hospitals seem to be in a state of chaos or more probably of evolution. Perhaps your readers may think that I dwell somewhat unduly upon the hospital question, but when it is considered that it is one of the most insistent questions of the hour, both from the point of view of the medical profession and of the general public, it is difficult for a writer on medical matters to evade it. At once it may be said that the situation is as bad and in many respects worse than ever. No solution of the problem appears to be in sight. Two letters contributed to the *London Times*, May 12th, from chairmen of two of the most important London hospitals will show more clearly how affairs stand than anything I can say. Lord Knutsford has been referred to in these letters previously. He is the chairman of the immense London Hospital, situated in the midst of the poorest district of London, and has made for himself a name throughout the length and breadth of the land for the manner in which he has kept the institution going despite the fact that its endowment is trifling. Indeed it has been for years the very type of a voluntary hospital. Lord Knutsford writes as follows: "Owing to the serious position of the London Hospital, the committee settled at their last meeting to close two hundred beds, and to cut down the out-patients by 35,000. The patients now occupying the beds will, of course, remain until well enough to leave, but no more patients will be admitted to them. The announcement has caused consternation in East London. This means that in a fortnight or so hence 200 beds in England's largest hospital will be closed and what adds to the tragedy of it is that there is today an accepted list of 761 poor people waiting for a vacant bed, whose illnesses have been recognized by the medical staff as curable only if they can get inpatient treatment."

The other letter is from the chairman of King's College Hospital, the hospital immortalized by the fact that Lister was a member of the staff. The letter reads thus: "About this time last year it became known that the voluntary hospitals in Lon-

don were faced with a financial crisis, and that unless some special grants could be made to them they would be compelled to close many of their beds. This disaster was averted, but the position today is unfortunately no better than it was twelve months ago, and there appears to be no prospect of immediate relief. So serious indeed has it become that at two hospitals a decision has already been taken to close wards, which will reduce the number of beds available by nearly 400, and it is certain that this example must be followed by others unless debts can be paid and larger income assured for the future. Hospitals have carried on in the hope that payment by patients, assistance from approved societies, or the institution by the Government of a general health scheme in which they could participate and be paid for services rendered would relieve them of their difficulties but, in fact, many of them are faced with great debts and can no longer gamble on hopes for the future. These debts were in some cases incurred or increased during the war. At King's College Hospital, in the years from 1914 to 1919, three quarters of the beds were devoted to military patients of whom nearly 31,000 were treated; but voluntary contributions and income from endowment exceeded the total amount paid by the War Office in those years by over £34,000, and in addition the hospital spent during the same period nearly £34,000 more than it received. I think it is clear that the Government received much more than it paid for, and I do not believe that voluntary effort would be discouraged if in such cases grants from public sources were made with the object of helping to extinguish the debt."

Although the prospect for the hospitals seems dark, there are some gleams of light breaking through the prevailing gloom. They received recently a large amount from the National Relief Fund as well as a goodly proportion of the surplus of something like £7,000,000 of the approved societies. But these are merely stopgaps. What is required is the evolution and carrying out of a scheme which will place them on a sound financial basis. Better organization is needed, closer cooperation between the hospitals and perhaps, above all, a well arranged pay system.

* * *

Sir James Cantlie seems to be endeavoring to rival the gloomy Dean of St. Paul's, Dean Inge, as a prognosticator of evil and a sayer of caustic albeit frequently pertinent phrases. He has within the past few months inveighed in no measured terms against many of the habits of the modern man and woman, which he regards as contrary to the laws of health. The other evening he addressed members of the tobacco trade on Tobacco and Health, at a conference in London. Sir James as a matter of fact, used mild language with regard to tobacco. He described it as a luxury, and hesitated to call it a physical necessity. But, in his opinion, it was none the worse for being a luxury. While he could not assert that it had done people any good physically, neither could he state that it had done any harm. According to Sir James, tobacco is one of the four social poisons, the other three being tea, coffee and alcohol, and it was the last of the four

to be introduced. Alcohol was known by the first man, and it would go on for ever and ever. He hastened to explain, however, that the juice of the grape was one thing, and alcohol as we know it today, another. Tobacco might cause trouble now and again, but it was not nearly so dangerous as alcohol. If a person gave up tobacco for three days, he would free his body of every particle of nicotine. Taken at the first blush, tobacco was the least harmful of the social poisons, and tea was the most harmful. The speaker unreservedly condemned cigarette smoking and said that when he was a boy it was only the villain of the piece who smoked a cigarette. Cigarette smoking was a habit that came from the East. The French, who were early cigarette smokers, were taught by the Arabs. He considered that cigarette smoking stained one's inside worse than it stained one's skin and he proceeded to point out the dangers of inhalation which, he said, tended to make the lungs leathery. He had heard of a man who smoked an ounce of tobacco every day of his life, and yet lived one hundred years. If that man had smoked an ounce one day and half an ounce the next day, he would not have lived so long. The smoker tuned his heart to a certain amount of nicotine, and he should be very regular in the amount of tobacco he smoked. Referring to smoking by women, Sir James pointed out that woman-kind had long been addicted to the habit.

* * *

Notification of venereal disease has been proposed more than once in this country but the proposal does not seem to find favor with the medical profession as a whole. A Dr. James Hamilton in a letter contributed to the *Medical Press and Circular*, May 11, 1921, pertinently points out that were it possible to spy out all women, professional and otherwise, with venereal disease and segregate them, there would be a rational ground for compulsory notification, but as that is impossible, compulsory notification would only tend to self-medication, as women especially would not consult a doctor if notification were compulsory and would treat themselves.

* * *

There has been a good deal of discussion recently on the endowment of motherhood and undoubtedly with regard to the welfare of the race such a scheme has much to be said in its favor. But it also has several obvious drawbacks. At the League of Nations Labor Convention, held some little time ago, it was proposed that the State should support women industrial workers before and after childbirth. Sir Alfred Watson, the British Government actuary, urged many objections to the scheme from the financial viewpoint. He estimated that of approximately 4,520,000 women of childbearing age belonging to the industrial classes, about 460,000 would be entitled to benefits under the convention. As regards single women, about half of the unmarried mothers are domestic servants who are excluded from the scheme. Taking married and single women together, the number of births among those industrially employed would probably be about 120,000. It is further pointed out that the title to benefits is governed solely by the employment of the mother, and is independent of the position of the

father. From this it would appear open to question whether in practice the benefits could be limited to employed women, and it does not seem unreasonable to assume that there would spring up an immediate and insistent demand for the extension of the benefits to mothers of every social class irrespective of any question of employment. The proposal is that in every case where the grant becomes due, benefit shall be paid for six weeks following confinement and that it shall be open to the woman to give up employment at any time within six weeks of the expected date and commence to draw benefit forthwith. This implies twelve weeks' benefit in each case. A uniform rate of benefit is not laid down, but the amount is to be determined separately in each county. Assuming that the benefit was fixed at no more than twenty shillings a week, the cost for each woman would amount to £14 including, say, £2 for medical expenses. On the assumption that effective means of protection could be devised the cost of the scheme is estimated at about £1,700,000 a year.

Sir Alfred Watson points out that this estimate is subject to two conditions: 1. That the benefit did not draw into the labor market a large number of married women who otherwise would never have sought industrial employment. If this should happen the cost might easily be doubled. Other untoward consequences would also follow. Competition for work would increase unemployment, promote casualization and, in the long run, lower wages. 2. That the provision of the new benefit was not followed by an increase in illegitimacy. The provision of an unconditional subsidy to maternity of employed women, represented by a benefit of several pounds might have reactions which should not be overlooked. If the benefits were universal at £1 for each birth the cost would be over £15,000,000 a year.

* * *

Women appear to be invading what used to be deemed the especial realms of men, more and more as time goes on. There has been recently quite a heated discussion in the public press regarding the desirability from the health viewpoint of girls taking up very strenuous games and physical exercises as part of their training. Opinions differ somewhat widely on the subject, but the general view seems to be that exercises of a vigorous nature do most girls good, but that they are not suitable for women. Now educational authorities here are entrusting women with the physical training of boys. A strong protest against this new departure was made at the conference of the National Association of Schoolmasters, held at Cardiff recently. Mr. G. K. Sanderson, of Leeds, said that educational authorities throughout the country were appointing women to take charge of physical training, but by far the worst offender was the Board of Education itself. That board had eleven inspectors in that branch of education. The head of the department was a man, but of the remaining ten inspectors in charge eight were women. If women were not fitted for the physical instruction of boys, how much less were they fitted to supervise the men who were doing the work.

Book Reviews

SEX IN HYSTERIA.

Das Geschlechtsleben der Hysterischen. Eine medizinische, soziologische und forensische Studie. By Dr. med. PLACZEK, Nervenarzt in Berlin. Bonn: A. Marcus & E. Weber's Verlag, Dr. jur. Albert Ahn, 1919. Pp. 264.

This is a book to hold the reader from beginning to end. In fact, the brief foreword with its few pointed sentences rouses an eagerness to enter into the variety of material which these few words promise.

There is a special clearness of style on the part of the writer. He is never verbose nor extravagant of detail but strikes that most happy balance which comes of abundance of well mastered material presented with a commanding power of expression. He has a keen eye for facts and a broad basis of judgment in handling men. The book becomes a literary as well as a strictly technical treatise upon hysteria. It goes to prove indeed that hysteria, participating as it does in every walk of life, must needs be treated in that broader relationship which constitutes also a literary balance in writing. It suggests a still further truth, and that is, that the sex life is no narrow technical subject but extends itself into every phase of life and its discussion, even as related to one particular form of mental disturbance, is bound to take wide account of life.

The one ground on which one might quarrel with the writer lies just here. The quarrel need be no bitter one for Placzek has gone much further than half way to meet his critic. One only wishes that so progressive a thinker and observer had opened his eyes just a bit more widely. In reading his book carefully one fails to find him bound in actuality to any limitation of the sexual etiology or manifestation of the sexual as a factor to be considered in hysteria. Yet he repeatedly asserts his disbelief in the sexual as the complete etiology concerning hysteria. In this he frankly states his differences with Freud and his followers. He comes so close, however, to Freudianism, so hospitably accepts much of its service and its theory, one feels that only a little more understanding is needed. This, however little, is important, for he makes a mistake that is common in not sufficiently comprehending how all pervasive sex is in the sense in which Freud uses it, not alone in its more limited sense, but also in its polymorphous manifestations as it underlies and creates hysterical reactions. Placzek does not quite grasp the concentrated dynamism which underlies life's manifestations and which must necessarily be inseparable from the sex pouring through it and really constituting it.

Yet no criticism of Freud has appeared more sanely fair than this of Placzek. He evinces no emotional resistance which prevents a calm survey of the work Freud's theories have accomplished. One of his brief and by no means antagonistic expressions of disagreement reads thus: "One may take what position one will in regard to the Freudian theory; one may complain of its outgrowths, which are especially to be laid to Freud's disciples;

one may regret its onesided pansexualistic interpretations; nevertheless it has been thought out by a profound, intellectually gifted thinker. It has already given fruitful incentive in many directions, it has brought deep and dark phenomena closer to the understanding and, what is none the less important, it has shown the significance of sexuality in a manner that is awakening medical science from its fixation upon a too long exercised ostrichlike policy toward everything sexual." There are many other similar expressions of appreciation for the service Freud has rendered the theory of hysteria.

The book also has a positive value of its own. It embodies a rapid survey of the theory of hysteria throughout the history of medicine with reference especially to the swinging back in most recent times to the ancient conception that hysterical manifestations were somehow related to the sex life. Now, the writer insists, this is rightfully the position to be taken and it can be taken more fully than was possible in earlier times. He proceeds to show how the recognition of this relationship is inevitable in a review of the facts of the manifestations of hysterical characters whether viewed purely from clinical experience, or in cases involving legal situations. He quotes a number of cases which at various times have come prominently before the public and shows the farreaching sexual involvements in each one as well as the strong sexual features in the individual's makeup. There is an enlightening discussion of the relation of witchcraft to the sexual constitution manifested in the hysteric both in the past history of witchcraft and in the present day manifestation in hallucinatory or other forms of phantasy of the same factors which earlier led to belief in witchcraft.

Special chapters are given to those phenomena which have particular legal bearing, such as the pathological lying impulse or that of stealing, useless purchasing, and so on. More individual clinical symptoms get a somewhat briefer mention but are passed over comprehensively although rapidly. Two sections deal respectively with the hysterical woman and the hysterical man in their typical manifestations. Chief emphasis is laid upon the social and legal bearing of hysteria and the importance from these viewpoints of recognizing with full comprehension the pervasion of the sexual through all these relationships. For this reason there are important chapters dealing with definite forensic questions as related to hysterical individuals.

The whole work is stimulating to thought. It is instructive in the history of the hysterical theory as understood by its various chief exponents. The author has reviewed these different expositions, particularly of his contemporaries, with free inter-spersion of his own valuable comments. He has opened the way to wider interest in the subject and he awakens interest in its still more intensive study in all directions. Chiefly does he demand the attention of his readers to the seriousness of the

sexual aspect of the question which he constantly holds before them. He has certainly opened rather than blocked any avenue of further thought or research here, even though he himself has pursued it more in the field of effect than of cause. If he penetrated the latter more completely perhaps he would be compelled to a fuller acceptance of Freud's more sweeping position. It is no small service, however, to impress upon the medical world the more obvious facts in the field of results of sex factors because even these, as Placzek has said, have been strangely neglected.

DISEASES OF NOSE AND THROAT.

Diseases of the Nose and Throat. By HERBERT TILLEY, B. S. (Lond.), F. R. C. S. (Eng.), Surgeon, Ear and Throat Department, University College Hospital, London; Surgeon, Ear and Throat Department, King George's Hospital; Teacher of Laryngology and Otology, University of London; Laryngologist to the Radium Institute, etc. Fourth Edition. With Seventy-four Plates and Numerous Text Illustrations. New York: Paul B. Hoeber, 1920. Pp. xx-844.

The author and publisher have combined to present a volume of unusual excellence, both as to text matter and appearance. This is a manual belonging to a *Practical Series*, and therefore the author devotes most of his attention to the subjects of symptoms, diagnosis and treatment, although there is no evidence of neglect in the consideration of etiology and pathology.

Old chapters have been completely or partly rewritten for this fourth edition, and new chapters have been added on certain affections of the trachea and esophagus, intranasal dacryocystotomy for the relief of suppuration within the lacrymal sac, and a description of the intranasal routes employed in operations for pituitary tumors. Greater attention also has been given to postoperative treatment, than in previous editions. The chapters on the tonsils are carefully written and the teachings generally are distinctly conservative in character. The author considers chronic tonsillitis in children a menace, and believes the possibilities for evil are greater than the probabilities of danger incident to the removal of the tonsils, while the difficulties, risks and complications of operative intervention increase with the age of the patient. There is a good chapter on endoscopy of the breathing passages, well illustrated. The drawings throughout are clear and plentiful.

LIGHT AND RADIANT ENERGY.

Light By FREDERICK BOOTH, Author of *Radiant Energy and the Ophthalmic Lens*. Introduction by WHITEFIELD BOWERS, A. B., M. D., Formerly Major, M. C., U. S. A. South Bend, Ind.: Frederick Booth, 1921. Pp. 15.

Radiant Energy and the Ophthalmic Lens. By FREDERICK BOOTH. Introduction by WHITEFIELD BOWERS, A. B., M. D., Formerly Major, M. C., U. S. A. Two Hundred and Thirty Illustrations. Philadelphia: P. Blakiston's Son & Co., 1921. Pp. xxvii-226.

It is easy to pick flaws in theories more or less tentatively advanced to explain phenomena which are not understood; it is quite a different matter to correct those flaws, or to construct a new and better theory. The author of *Light* has done the first, but has not attempted the second. If he has advanced a constructive idea, it has escaped the reviewer.

In the second book, one of 211 pages, excluding the index, the reviewer has vainly sought for something new. The writer says: "In order to obtain a better understanding of optics, I have included radiant energy. These sections describe the ether theory; also actinic light, electrical heat, cathode, x ray, alpha, beta, and gamma rays; sound and water waves; also waves in a rope. Harmonic motion is described. The various theories of light are explained." All of these things are mentioned, but the best that the reviewer can make of the book is that it contains a lot of facts well known to every student of optics, stated curtly and not always in the clearest manner. It is not well written. The definition of radiant energy on page 6 is a meaningless jumble of words as it stands, though the reader can easily understand what is meant. On page 120 he says: "In testing the refraction, unless the ciliary is relaxed (a cycloplegic is positive), the optical condition of an eye cannot always be ascertained." The book is profusely illustrated and references to other writers abound, but it will give little help to the student of ophthalmology.

WAGNER IN ENGLISH.

The Pertinent Wagnerite. By B. M. STEIGMAN. New York: Thomas Seltzer, 1921. Pp. 127.

This title introduces a series of brief essays of the sort that are gradually recalling us from our hasty reactions when the event of war precipitated convictions out of emotion without the cooling aid of reason. The writer pokes fun at us over the head of a pretended serious proof of Wagner's prophetic powers and thoroughly pro-Ally spirit. He shows Wagner as enlisting the personnel of *Der Ring des Nibelungen* to foretell the events of the war and to preach to the last detail all the gospel of the new democracy rising upon the downfall of kings. Then Steigman goes on to show what remarkable similarity in action we produced to the actions of destruction for which the enemy were decried when we stormed against the production of the works of this master of art. He goes further and reveals in some detail the mutilation which the English translation has perpetrated upon these monuments of thought and art. He seriously sounds a note of warning of the permanent effect this is likely to have upon our artistic taste as it silently condones us in that slipshod habit of art of which we are guilty. There is more of this sort of half fun making, half seriousness, recalling us to ask ourselves what we really have been about and what is our responsibility toward the future. This is not alone in regard to these works of art but to the justice of calmer thought and action as a matter of truth to ourselves both artistically and morally.

The writer has pertinently—we borrow his word—laid his finger upon some of the psychology at work within us, some of those deeper facts from a too clear knowledge of which we squirm away under cover of mob sentiment. Now that the war is over and Wagner has come back, even in a mutilated condition, it will not hurt us to think at least a little in regard to our psychology as a group of facts. Steigman might have been a little more clear in his statements, then his fun and his seriousness would

both have gained in pungency. Nor has he been quite fair to Wagner. It does not matter that he has indulged in a completely worked out interpretation of his own in regard to the Ring. A pretty one it is too in the face of recent events. A master's works remain quite unaltered by any such borrowed use of them. Wagner might have been impatient with any such surface interpretation but he did have a ready humor as a personality even though he did, as Steigman reminds us, allow the swan to be borne out on a flimsy litter. But there are places where Steigman has touched upon deeper psychic meanings and we do not think he has always been happily correct. The attempt to put a temporizing explanation warps the appreciation or realization of some of the more fundamental truths. Wagner seized with a threefold grasp profound human truths which have been and will be while humanity shall stand. Steigman is right that none of his forms of expression, words, music, characterization can be divorced from the others. Beneath and within them lie the psychic truths themselves, deeper than any fun, than any partial or specially applied interpretations, deeper than all the scorching flames of war.

BERGSON'S PHILOSOPHY.

Bergson and Future Philosophy. An Essay on the Scope of Intelligence. By GEORGE ROSTREVOR. London: Macmillan & Co., Ltd. Pp. 152.

Rostrevor in his criticism of Bergson reasons in an interesting fashion even though his conclusions are not conclusive. He has built a superstructure of philosophy on a flimsy base for his entire concept of instinct is altogether too mystic. Philosophers of his type, who are earnestly seeking the truth and are forced to accept rational substitutes, would do well to look upon instinct as unconscious memory. This would remove much mysticism and enable Rostrevor, Bergson, and a host of his followers better to understand the past and also the consciousness of the present. They have given us many invigorating ideas and have clarified many obscure points and it is to be regretted that they cannot accept the more simple yet more workable hypothesis of unconscious memory. They could then divide it into the phylogenetic and otogenetic unconscious—keeping it separate from the conscious. Perhaps we are asking too much of them, forgetting for the moment that they profess to be philosophers.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

BERGSON AND FUTURE PHILOSOPHY. An Essay on the Scope of Intelligence. By GEORGE ROSTREVOR. London: Macmillan & Co., Ltd., 1921. Pp. 152.

DIE PROPHYLAXE UND THERAPIE DER ENTEROPTOSE. Für die ärztliche Praxis dargestellt Von Prof. LUDWIG KNAPP, Prag. Berlin and Wien: Urban & Schwarzenberg, 1921. Pp. 118.

PSYCHOANALYSIS AND THE UNCONSCIOUS. By D. H. LAWRENCE. New York: Thomas Seltzer, 1921. Pp. 120.

PRACTICE OF MEDICINE. A Manual for Students and Practitioners. By HUGHES DAYTON, M.D., New York. Fourth Revised Edition. Philadelphia and New York: Lea & Febiger, 1921. Pp. xi-328.

THE GENUINE WORKS OF HIPPOCRATES. Translated from the Greek, with a Preliminary Discourse and Annotations, by FRANCIS ADAMS, LL.D., Surgeon. Two Volumes in One. New York: William Wood & Co., 1921. Pp. v-366.

LIGHT. By FREDERICK BOOTH, Author of *Radiant Energy and the Ophthalmic Lens*. With an Introduction by WHITEFIELD BOWERS, A. B., M.D., Formerly Major, M. C., U. S. A. South Bend, Ind.: Frederick Booth, 1921. Pp. 15.

A HISTORY OF PSYCHOLOGY. By GEORGE SIDNEY BRETT, M.A. (Oxon.), Professor of Philosophy in the University of Toronto. Volume II: Medieval and Early Modern Period. London: George Allen & Unwin, Ltd. New York: The Macmillan Company, 1921. Pp. 394.

CANCER AND ITS NONSURGICAL TREATMENT. By L. DUNCAN BULKLEY, A. M., M.D., Senior Physician to the New York Skin and Cancer Hospital; Member of the American Association for Cancer Research. New York: William Wood & Co., 1921. Pp. viii-457.

THE SEEDS OF ENCHANTMENT. Being Some Attempt to Narrate the Curious Discoveries of Dr. Cyprian Beamish, M.D. Glasgow, Commandant René De Gys, Annamite Army, and the Hon. Richard Assheton Smith, in the Golden Land of Indo-China. By GILBERT FRANKAU. Garden City, N. Y., and Toronto: Doubleday, Page & Co., 1921. Pp. x-364.

URINARY ANALYSIS AND DIAGNOSIS, BY MICROSCOPICAL AND CHEMICAL EXAMINATION. By LOUIS HEITZMANN, M.D., New York, Formerly Professor of Pathology and Bacteriology, Fordham University School of Medicine, New York. Fourth Revised and Enlarged Edition. With One Hundred and Thirty-one Illustrations, Mostly Original. New York: William Wood & Co., 1921. Pp. xxi-362.

THE CLINICAL STUDY AND TREATMENT OF SICK CHILDREN. By JOHN THOMSON, M.D., F. R. C. P. (Edin.), Honorary Member of the American Pediatric Society; Consulting Physician to the Royal Edinburgh Hospital for Sick Children; Formerly Clinical Lecturer on the Diseases of Children, University of Edinburgh. Third Edition, Rewritten and Greatly Enlarged. With Two Hundred and Forty-nine Illustrations. Edinburgh and London: Oliver & Boyd, 1921. Pp. xxxii-877.

HUMAN PHYSIOLOGY. By Prof. LUIGI LUCIANA, Director of the Physiological Institute of the Royal University of Rome. With a Preface by J. N. LANGLEY, F. R. S., Professor of Physiology in the University of Cambridge. In Five Volumes. Volume V: Metabolism, Temperature, Reproduction, etc. Edited by M. S. PEMBREY, M. A., M.D., Professor of Physiology, University of London, and Lecturer in Physiology, Guy's Hospital. New York and London: Macmillan & Co., 1921. Pp. viii-422.

THE EVOLUTION OF DISEASE. With a Discussion on the Immune Reactions Occurring in Infectious and Noninfectious Diseases. A Theory of Immunity, of Anaphylaxis, and of Antianaphylaxis. By Prof. J. DANYSZ, Chef de Service, Institute Pasteur, Paris. Translated by FRANCIS M. RACKEMANN, M.D., Assistant in Medicine in the Harvard Medical School; Assistant in Medicine in the Massachusetts General Hospital, Boston, Mass. Philadelphia and New York: Lea & Febiger, 1921. Pp. xii-194.

DISEASES OF THE SKIN. A Practical Treatise for the Use of Students and Practitioners. By OLIVER S. ORMSBY, M.D., Professor and Head of the Department of Skin and Venereal Diseases Rush Medical College (in Affiliation with the University of Chicago); Dermatologist to the Presbyterian, St Anthony's and West Suburban Hospitals, and the Home for Destitute Crippled Children. Second Edition, Thoroughly Revised. Illustrated with Four Hundred and Forty-five Engravings and Four Plates in Colors and Monochrome. Philadelphia and New York: Lea & Febiger, 1921. Pp. xiv-1166.

Practical Therapeutics

PARAFFIN TREATMENT OF BURNS.

By HARRY COHEN, M.D.
New York.

Attending Surgeon, Peoples' Hospital.

About ten years ago it was my privilege to treat three cases of extensive burns. The first was in a woman thirty years of age, who had received a third degree burn on her chest and back from the sudden outburst of flames after pouring kerosene into a stove to brighten the fire. She was sent to a hospital where she received the open air treatment. Healing took months, and resulted in a very painful keloid formation of the whole back and chest, which lasted for years. The second case was a severe scalding with boiling water of a considerable part of the body in a little child, who died on the third day, in spite of active treatment. In the third case, a child had sustained an extensive burn of the body and had been treated with picric acid for about a week. The child was delirious and very toxic. A striking feature was the condition of the urine, which was scant and of a dark color. The picric acid was discontinued, boric acid solution applied and constitutional treatment vigorously pushed. This child recovered, but the constitutional symptoms were always marked. These experiences caused me always to dread treating extensive burns. In reviewing the literature previous to the last few years, similar experiences and results appear to have been the rule.

Recently a patient with an extensive third degree burn came under my observation. The paraffin treatment was applied with an excellent result. The paraffin treatment will most likely be the method of choice in the future.

PROGNOSIS.

Leale (1) sums up the prognosis in burns, as follows. In first degree burns if two thirds of the body is burned or in second or third degree burns if more than one third of the body is burned, especially in adults, the prognosis is bad, usually fatal. In children even less area is necessary for a terminal result. With many exceptions this has been the general experience.

PATHOLOGY.

In a thorough review of this subject, Weiskotten (2) discusses the possible causes of death that had been advanced as follows:

1. Toxins acting in the body after extensive burns of the skin.
2. Loss of the function of the erythrocytes.
3. Production of thrombi.
4. Severe affection of the nervous system.

Bardeen (cited by Weiskotten) performed five autopsies on children who had died in a few hours after being burned and found early changes in the lymphoid tissues of the body and parenchymatous degeneration of the liver and kidneys.

Weiskotten (3) performed ten autopsies in burn cases, five in adults and five in children. The ages ranged from nineteen months to sixty years. The

deaths occurred from a few hours to twenty days. In none of the cases was there charring. His findings may be called authoritative. There was a uniformity of pathology in all cases. He observed the main lesions in the adrenals. These were swollen, deep red and on section showed congestion of the blood vessels and minute hemorrhages. The condition of the cells resembled the appearance of the liver in chloroform poisoning. In the spleen and lymph nodes there was edematous swelling especially of the germinal centres. The changes in the spleen and lymph nodes suggest that the changes are due to the presence of a poison in the circulating blood. In the heart, there was distinct hyaline degeneration of the fibres, the same as is seen in deaths from diphtheria, scarlet fever, and severe toxemias. The kidneys showed small fibrin thrombi. In the gastrointestinal tract small hemorrhages of the mucosa and punctate ulcers of the stomach were present. These findings, especially in the adrenals, will explain the sudden death and also many of the early symptoms that so many have called attention to, such as shock and fright.

METHODS OF TREATMENT.

The treatment may be divided into two groups: the old or ordinary method, and the new or paraffin.

A brief description of some of the popular and fairly well sponsored forms of treatment for burns other than paraffin are carron oil, wet dressing, open air, continuous bath, ointments, adhesive strips and rubber tissue strips.

Carron oil is a distinctly popular remedy both with the general public and some physicians. It is, however, universally condemned by the majority of surgeons who treat many burn cases because it almost always infects the wound.

Ravogli (4) in a paper read at the sixty-sixth annual session of the American Medical Association described the various forms of treatment then in vogue. He laid considerable stress on the value of wet dressings of aluminum acetate. The wound should be cleansed and wet compresses applied. Although this treatment has many advantages over other methods, there are several disadvantages, viz. the difficulty of keeping the gauze saturated, and of drying in places resulting in adhesions forming between the gauze and tissue. Haas (5) who advocated the open air treatment, in speaking about the other forms of dressings, says: "The terrors of the one waiting for the next dressing and the shrieks which accompany such a dressing are not easily forgotten." Also from another surgeon: "The removal of gauze which becomes enmeshed in the burned surfaces and granulations is a very painful and barbarous procedure and should be condemned." (Sherman, 6).

The continuous bath treatment, as its name implies, consists of placing the patient in a tub of warm water and keeping him there continuously until cured. This has no special advantages over other methods, and is difficult to carry out.

Picric acid used in one per cent. solutions as wet

dressings has many exponents and undoubtedly possesses many excellent healing qualities, but it stains everything yellow, and in the case originally described possibly many of the toxic symptoms were due to the absorption of the picric acid.

As for ointments, there are countless numbers of them in use, boric acid being the one most frequently employed. Others are salicylic acid, resorcin, dermatol, and zinc oxide. Although each has some good qualities, they are relatively expensive, require considerable gauze, are not easy to handle, stick to the tissues, and do not prevent ugly scars and contractures from forming.

The open air treatment, first sponsored by Haldor Sneve (7), consists of placing the patient in bed and leaving the burned parts exposed to the air, the other parts of the body being well covered. In warm weather cheese cloth or mosquito netting is placed over the bed to keep flies from the wound. Herrman (8), in addition to exposing the parts to the air, makes use of a dusting powder, preferably boric acid. Haas who advocates the open air method says: "To be sure, this method of treatment does not create a pleasant view. The odor and appearance of the wound are two objectionable features as is also the tendency of the patient to pick off the scabs." A serious objection, however, to this method of treatment consists in the disfiguring scar formation which frequently follows.

Parker (9) treated burn cases with adhesive plaster strips about one inch wide and slightly overlapping one another, the purulent discharge underneath the plaster making removal easy. He also applied casts and other apparatus to prevent contractures.

A method that for a time proved popular simulated the adhesive strips, using instead sterile rubber tissue or silver foil strips. This treatment was advocated by Leale. In both these methods scar formations very frequently follow.

THE PARAFFIN TREATMENT.

We now come to the paraffin treatment. This method was first advised sixteen years ago by Barthe de Sandfordt, and although the results appeared satisfactory, he was unable to popularize the treatment. The war presented a great opportunity for its use, however, and as the results were very satisfactory, its use was popularized. It was introduced into this country largely by William O'Neill Sherman who gave a thorough description of the preparation and its application.

Barthe de Sandfordt called the preparation he used ambrine (a compound of paraffin and resin). The two main reasons why it failed of popular approval in this country were, first, its recommendation for all kinds of diseases and, second, that the preparation was secretly patented and highly commercialized. During the war when de Sandfordt treated thousands of cases of all degrees of burns with ambrine, it was very evident that the patients when having their wounds dressed suffered no pain and recovered very rapidly with fewer scars and contractures. "Frightful disfigurement and loss of function were practically eliminated." (Sherman).

The paraffin does not cure, it simply acts in a mechanical way allowing nature to heal under con-

ditions favorable to repair. It excludes the air, maintains a constant temperature, and forms a protective dressing. It "serves as a superstructure or scaffolding to new epithelium which rapidly regenerates. The dressing serves as a poultice and cast. A secretion soon forms under the dressing which makes it easy to remove without pain, or bleeding or destroying the new regenerated epithelium, thereby facilitating the healing without apparent contracting cicatrices and without causing functional disability." (Sherman).

METHODS OF APPLICATION.

Briefly stated, the method consists of the following: Careful and gentle cleansing, removing all blebs; drying; paraffin layer; layer of absorbent cotton; paraffin layer; heavy dressing; bandage.

The practical method of its application may be more fully described in the following way. If the patient is seen immediately following the burn, the paraffin is applied at once. The paraffin preparation, either ambrine, redintol, parresine, stanolind or other preparations of which there are many on the market, is placed in a double jacketed atomizer and heated until the paraffin preparation is liquified. It is then sprayed over the burn, going beyond the margin about one or two inches. A thin layer of absorbent cotton or gauze is then spread over the wax film and the paraffin again applied, covering the cotton. The latter application is made by means of a camel's hair brush, as with this the area is covered more quickly. If the patient is confined to bed, that is all that is necessary. If ambulatory, a heavy layer of absorbent cotton is applied and then a bandage. The burn must be dressed daily, when a considerable discharge of seropus will be found under the paraffin, loosening and lifting it up and making its removal easy and painless. Each subsequent dressing is a repetition of the first. The pus does not cause any constitutional disturbances and in fact is a help in that it facilitates the removal of the paraffin cast. Where pus is too profuse or where absorption symptoms occur (fever, redness, and swelling) the paraffin treatment is discontinued for a day or two and the Carrel-Dakin solution applied. Chemical, x ray, electrical, and all other kinds of burns are amenable to this treatment.

Cassellberry (quoted by Sherman) treated seventy-five cases from a munitions explosion and had excellent results. His observations were: relief from pain, patient cleaner and more comfortable, fewer scars and contractions, skin grafting rare, more rapid healing, and he believed the method to be superior to other methods commonly used.

Behney (10) calls attention to the treatment of exuberant granulation tissue which is encouraged by this treatment. He says that granulations become vigorous and healthy and are controlled by pressure. He warns against the use of silver nitrate, because, if used, the healed skin will not be smooth. Although grafting is minimized, still in extensive burns he advises early grafting, usually in about three weeks.

The only disadvantage that Beiter (11) found was that more time and patience were required to apply this treatment. He also found that furuncles developed less frequently.

Hudson (12) voiced the sentiments of many when he objected to ambrine because it was patented, composed of a secret formula, and commercialized. However, many of these objections have since been overcome. An excellent and inexpensive formula devised by Max Kahn (13) is:

Paraffin	70.0 gm.
Liquid petrolatum, U. S. P.	3.0 c. c.
White beeswax	10.0 gm.
Rosin	7.0 gm.
Resorcin	0.2 gm.
Sudan III	0.05 gm.
Alcohol (95 per cent.)	10.0 c. c.

Other formulæ are given by Sollman (14).

Emerson (16) objected to the paraffin treatment, stating that he could not heal one case in twenty-three, claiming among the disadvantages that the wound was covered with a sealed dressing, that a copious seropurulent exudate was present on every dressing removed, and that there was no way of controlling the temperature of the wax. To answer these objections briefly, the seropurulent discharge is an advantage because it does not produce absorption symptoms and allows the paraffin to be removed painlessly, and if the paraffin is applied with an atomizer, there is no need of controlling the temperature of the wax as it is impossible to burn the patient.

The constitutional treatment depends upon the

COMPARISON OF THE THREE CASES.

	Girl	Boy	Mrs. K.
Extent of burn	Entire back from neck to gluteal folds, plus two arms.	Entire back from neck to gluteal folds, plus neck, one arm and hand.	Entire back from neck to gluteal folds, plus one arm
Treatment	Modified open air	Ointment adhesive strips	Ambrine
Duration of stay in hospital	Seven and a half months	Seven months	Three months, one week
Length of time of subsequent dressing	Seven and a half months	Still being dressed (1-15-21)	One month
Total duration of treatment	Fifteen months	Fifteen months plus	Four months, one week
Skin grafting	None	One year ago	None
Result	Considerable scarring and keloid formation	Ugly unsightly scarring.	Slight scarring

condition of the patient and consists of giving an initial hypodermic injection of morphine when indicated, stimulations with strychnine, and looking after the kidneys and intestinal tract.

The case reported below has two interesting features associated with it. In the first place, there were three persons burned at the same time and to about the same extent, but to each different treatments were applied. In the second place the condition of my patient was complicated by the presence of a large stone in the right kidney.

CASE.—Mrs. S. K., thirty-five years old, referred to me by Dr. J. Ruchman, was burned when her house set on fire during the early hours of Sunday, October 19, 1919. She and two others who were burned at the same time were removed to a hospital. The burns in each case were of about the same extent and all of the third degree. On the third day the patients were removed to different hospitals and in each case a different method of treatment was applied. One patient was treated with ointments for two or three months, following which the paraffin treatment was instituted for about a week and then given up (not a fair test), and for the rest of the time the treatment consisted of adhesive plaster strips. The second was treated by the open air method, and in addition was given warm baths about three times a week. These two patients were children, one thirteen years of age, the other ten.

The third patient was treated the first two days with wet dressings, and on being admitted to the Peoples' Hospital, was placed under my care. The first unpleasant task was to remove the gauze, which was painful. She was immediately placed under the paraffin treatment (ambrine preparation) according to the method previously described. The dressings were changed daily and gave her no pain. Originally the dressings were very tedious, later they took less time. There never was any constitutional disturbance. The result was excellent. The extent of the burn was as follows: The back of the left arm to elbow, the entire back, both buttocks, left thigh, left leg and left foot. Altogether she was in the hospital thirteen weeks, which seemed a discouragingly long time. She had to come for dressings to the office for four weeks more. A stubborn bit of granulation tissue on the shoulder required treatment during all this time.

About seven weeks after the accident, while still in the hospital for the burn, she had an attack of acute nephrolithiasis. Cystoscopy was impossible owing to the burned condition of her back. A röntgenograph showed a large stone, the size of a grape, in the parenchyma of the right kidney. On account of the burns she at first refused operation, but after suffering violent pains for a week, she consented, and on December 17, 1919, I did a nephro-

tomy and removed the stone from the parenchyma of the right kidney. She made an uneventful recovery and was out of bed in two weeks.

The following conclusions may be drawn from comparing these three cases:

1. Enormous time saved.
2. Skin grafting not necessary.
3. Dressings painless and comfortable.
4. Minimum scarring. In my case also, the presence of a serious kidney complication was possibly influenced for the better by this method of treatment.

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221 SECOND AVENUE.

NEW LARYNGEAL SPECULUM.*

By HENRY LOWNDES LYNNAH, M. D.,
New York.

The long slanting end anterior commissure speculum shown in Fig. 1 has been found very useful for the inspection of the larynx in adults, and also for the removal of tumors from the anterior com-

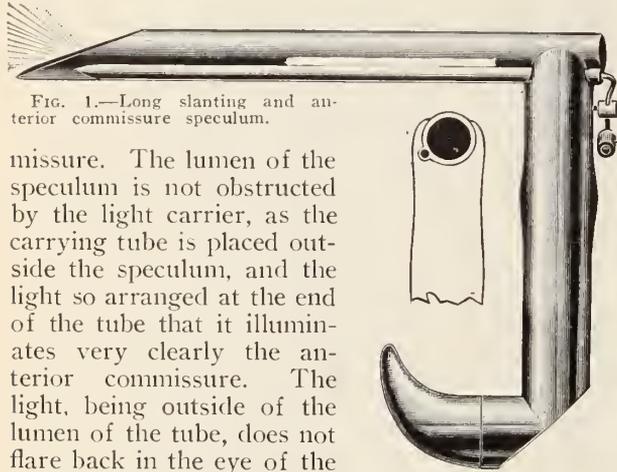


FIG. 1.—Long slanting and anterior commissure speculum.

missure. The lumen of the speculum is not obstructed by the light carrier, as the carrying tube is placed outside the speculum, and the light so arranged at the end of the tube that it illuminates very clearly the anterior commissure. The light, being outside of the lumen of the tube, does not flare back in the eye of the operator. The speculum is also useful for upper esophageal examination in children.

The ovoid laryngeal speculum for infants and children (Fig. 2), on account of its ovoid shape, is

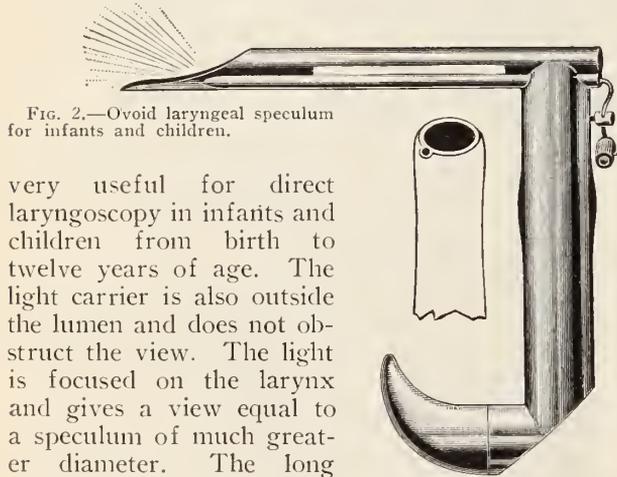


FIG. 2.—Ovoid laryngeal speculum for infants and children.

very useful for direct laryngoscopy in infants and children from birth to twelve years of age. The light carrier is also outside the lumen and does not obstruct the view. The light is focused on the larynx and gives a view equal to a speculum of much greater diameter. The long slanting end of the speculum contributes largely in producing this ocular appearance.

127 WEST FIFTY-EIGHTH STREET.

NEW TONSIL FORCEPS.

By ISIDOR F. SHAPIRO, M. D.,
New York.

The securing of a good grasp on the tonsil is, of course, essential to a successful dissection in the snaring method, particularly if the tonsil is of soft and friable consistency. The forceps illustrated has been found to have especially good seizing and holding qualities, due to the two new features of the

fenestration at A, and the receptive hollow at B; and being narrow, it does not get in the way of uvula or pillars.

In using this forceps the ordinary procedure is followed. It has been found that routine attention to the following steps gives uniformly good re-

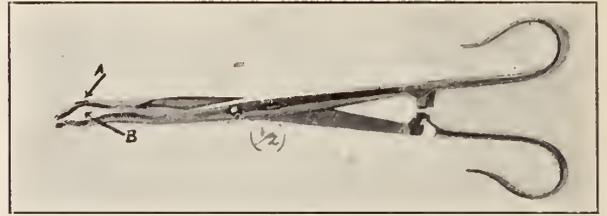


FIG. 1.—New tonsil forceps.

sults. First, using a tongue depressor, the forceps is inserted closed (to avoid grasping the uvula). Secondly, after the forceps touches the tonsil, its jaws are widely opened up to enclose both its lower and its upper poles. Third, before biting into the tissue the forceps is made to press the tonsil forward and outward, causing the anterior pillar to bulge. Fourth, in that position the jaws of the forceps are then shut, biting into the capsule. The operator may then proceed with his dissection, in the assurance that his forceps will not come away with small chunks of tonsil tissue.

For the subsequent dissection the author prefers an instrument which has the dissector combined on the other end of a tongue depressor (1). This enables the operator to save time in handling separate instruments, and before hemorrhage or frothy mucus has time to obscure the field he can complete the dissection and snaring, thus minimizing sponging and exposure of the patient to etherization.

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355 EAST 149TH STREET.

Treatment of Stenosis of the Esophagus.—Nathan W. Green (*Annals of Surgery* June, 1921) gives the following résumé: There were eight cases; two were in adults and six were in children three years old and under. One case of stenosis in an adult was due to sulphuric acid, and the other was recurrent after being treated in childhood. One was without history of burn, and was unquestionably congenital. It was coupled with stenosis of the outlet of the stomach. One in an infant gave the history of coming on after diphtheria. All eight were improved. All but one were cured with the necessity of occasional bouginage. One required further slight dilatation by the oral route. Four had the string sawing operation of Abbe. These were the worst cases and have done very well. Four had dilatation through the esophagoscope and were not treated so vigorously. The results are as good, but all kept track of are dependent upon following up with the bougie. The longest interval in the last six cases in which the bougie has not been passed is a year. In the milder types of stricture dilatation through the esophagoscope is sufficient.

*Presented at the annual meeting of the Association of American Peroral Endoscopists, Boston, Mass., June 1, 1921.

Dangers to Life of Severe Involvement of the Thorax in Rickets.—Edwards A. Park and John Howland (*Bulletin of the Johns Hopkins Hospital*, April, 1921) based their study on thirty-two colored children, between the ages of eight months and four and a half years. All of them showed well marked rachitic deformities of the thorax, with great weakening of the thoracic wall, and all were greatly underweight and undersized. In all there were characteristic x ray findings in the chest, which are fully described. The authors state that deformity and normal thoracic function are compatible, so that the element of danger is not the deformity, but the loss of rigidity of the thoracic wall. The only course of treatment recommended is the administration of cod liver oil in moderate doses, and the avoidance of infection and of those things which give rise to abdominal distention.

Antiscorbutic Potency of Milk Powders.—E. B. Hart, H. Steenbock and N. R. Ellis (*Journal of Biological Chemistry*, April, 1921) using the guinea-pig as the experimental animal, fed it a basal ration of heated alfalfa flour, rolled oats, and common salt, to which was added the milk powder to be studied. Milk powder made by the Merrell-Soule or spray process, that developed at the California Central Creameries, and that made by the Just process were compared as to their antiscorbutic power. This was found to vary considerably, for aside from the initial quantity of the vitamine in the milk as influenced by feed, the method of manufacture was important as the Just process was less destructive of the antiscorbutic vitamine than the spray processes. The authors state, however, that milk powders made in this way should not be condemned, but that the results obtained demonstrate their limitations when used as the sole source of nutrients in infant feeding. Probably with all milk powders, irrespective of their method of manufacture, the safest plan in a restricted dietary, especially in infant feeding, is to supplement the diet with some potent source of antiscorbutic vitamine.

Stability of the Antiscorbutic Vitamine and Its Behavior to Various Treatments.—N. R. Ellis, H. Steenbock, and E. B. Hart (*Journal of Biological Chemistry*, April, 1921) deal in this paper with the properties of the antiscorbutic vitamine, its destructibility by various processes, and its behavior to some common reagents and solvents. Cabbage, both in the undried state and as sauerkraut, and corn in the form of silage, were studied, and the effect of various treatments on orange juice was described. The antiscorbutic vitamine was not removed from the latter by either ether or aeration. Such oxidizing agents as hydrogen peroxide and potassium permanganate destroyed it, but the mild reducing action of molecular hydrogen was without effect, and a measurable amount of the vitamine was removed by blood charcoal and the Chamberlain filter. Desiccation of cabbage in an atmosphere of carbon dioxide for thirty-five hours at 65° C. did not prevent the destruction of the antiscorbutic vitamine, but fermentation processes involved in the making of sauerkraut from cabbage and silage from corn resulted in its destruction.

Nutritive Properties of Milk.—H. A. Mattill and Ruth E. Conklin (*Journal of Biological Chemistry*, October, 1920) found in an experimental study in the albino rat that a ration containing dry milk and one per cent. of yeast was the only milk diet studied which would permit normal growth and partially successful reproduction, and the growth of rats on this ration and on one containing five per cent. of yeast has been practically normal.

Vitamines in Milk.—M. J. Rosenau (*Boston Medical and Surgical Journal*, May 5, 1921) states that canned milks and dried milks retain the fat soluble A and water soluble B vitamins in almost their original potency. The only vitamine in these preparations that may be affected is the antiscorbutic vitamine. The amount of this in canned milk will vary with many factors, primarily the amount in the original milk, and, secondarily, upon the process of heating and evaporation, with special reference to oxidation.

Surgical Complications of Influenza in Children.—Blanc y Fortacin (*La Medicina Ibera*, December 27, 1919) found that in the recent epidemic these complications took various forms, namely, peritoneal, pleuropulmonary, perinephritic and osteomyelitic. When influenza attacked surgical cases postoperatively the results were much more grave than when a surgical condition supervened upon an original grippal infection.

Clinical Indications for Tonsillectomy.—M. Quackenbos (*Medical Record*, April, 1920) sets down the following four local conditions indicating enucleation: 1, New growth; 2, incomplete tonsil operations previously done; 3, recurring acute inflammations; 4, hypertrophy associated with Eustachian or nasal obstruction, and a fifth may be added in diphtheria carriers. Three reflex conditions warrant enucleation: 1, cough due to an enlarged lingual tag; 2, nocturnal enuresis; 3, petitemal or meningism. Other indications are cervical adenitis, arthritis or joint lesions, middle ear deafness and acquired palsy in childhood. Waugh's method is that of election.

X Ray Pictures of the Bones in the Diagnosis of Syphilis in the Fetus and in Young Adults.—P. G. Shipley, J. W. Pearson, A. A. Weech, and C. H. Greene (*Bulletin of the Johns Hopkins Hospital*, March, 1921) recommend routine examination of the osseous system in newly born children as a source of valuable diagnostic data. They state that it will insure recognition of the presence of a hereditary infection in a certain number of children who otherwise might go unaided for some time before some clinical symptom of the accidental discovery of a positive Wassermann would secure for them the much needed treatment. Three hundred white fetuses formed the basis of this study, ranging in age from the sixth month of intrauterine life to nearly term. The skeletons of twenty-five per cent. of the first one hundred examined showed marked signs of lues, and forty-six of the first one hundred examined showed well marked or suspicious lesions. Lues of the fetus and newly born child apparently interferes very little, if at all, even in advanced cases, with skeletal growth.

Proceedings of Societies

BRITISH ROYAL SANITARY INSTITUTE.

*Thirty-second Congress and Health Exhibition,
Held in Folkestone, June 20 to 25, 1921.*

Alcohol and Alcoholism.—An interesting feature of this congress was a breakfast given by the National Temperance League, over which Viscount Burnham presided. Dr. Courtenay Weeks delivered an address in which he said that alcohol and alcoholism were great coefficients in damaged life and disease met with in the national life of Great Britain. On this point there was the evidence of the chief medical officer of the Board of Education who said that there were in Great Britain over a million children of school age so defective, mentally or physically, that they were unable to derive reasonable benefit from the educational facilities provided by the State. There was also the testimony of the national insurance commissioners who said that there were lost annually, through sickness and disability among insured people, the equivalent of fourteen million weeks' work. The army authorities, in the last year of the war, found that 64 per cent. of all the men examined were physically unfit for the work of a soldier. In the asylums there were 125,000 lunatics and 150,000 feeble-minded persons and the chief medical officer of the Ministry of Health said that if the deficiency was to be met, the first thing they had to deal with was alcohol.

Sir GEORGE NEWMAN, who was a real leader among men, had said that if England was to be a healthy nation alcohol must first be dealt with, then venereal diseases, and finally feeble-mindedness, but the three went hand in hand. During the war the liquor control board was set up in the interests of efficiency and many of the restrictions established by this board should be maintained in peace. Experts of the board had reported on the scientific position of alcohol. That report had been embodied in a syllabus on the hygiene of food and drink which he hoped members of the institute would do all in their power to have placed in the curricula of the schools of the country.

Industrial Hygiene.—Viscount BURNHAM, president of the section of industrial hygiene, in his presidential address, said that Great Britain had paid in full measure the penalty of her past greatness. She was the first country to be industrialized and in advocating new methods, perhaps still more in inculcating a new spirit, they had run counter of settled habits of old established industry. On the other hand, he said, if her industrial system was old, if not senile, they could not get rid of their own responsibilities by blaming those who had gone before them. In the Victorian era it would have been considered an interference with divine providence, as well as with individual liberty, to attempt anything in the direction of industrial hygiene. The Manchester School of Economists would have thought this mollicoddling. It

was not want of humanity but difference in point of view that caused them to adopt this policy. On the other hand, possibly they were going too far in the other direction and safeguards were certainly required to prevent the national character from becoming enervated and even emasculated by too much supervision and interference. In America, welfare work, if imposed by those in authority in the factories and mills, was resented as being paternalism, and it was essential that in connection with the work being done in industrial hygiene in Great Britain, there should not be the spirit of paternalism, but the spirit of copartnership. Unless there was a concordat between employer and employee, it would be found that the great difficulty lay in a veiled hostility or an indifference to their own welfare by the working class. It was essential that there should be a free and frank alliance between employers and employed. Unless there was cooperation of energy and good will, the progress of social science would be slow. In the Whitley councils we had machinery which was admirably adapted to embody the spirit and perform the duties involved in industrial health and welfare. Those councils were never meant to be arbitration boards to deal with wages alone, but unless we had the active assistance and cooperation of the working people employed in all national industries, no matter what the code of sanitary legislation, or the zeal of medical officers of health, or how great the sympathy and good intention of employers, they would effect nothing morally, and little in any sense, to reach the purpose in view. In conclusion, Viscount Burnham spoke of the conditions peculiar to the printing trade and the methods taken through sanitation and ventilation to stamp out printers's phthisis.

The Organization of Welfare Schemes.—A paper on this subject was read by Mr. ROBERT R. HYDE, director of the Industrial Welfare Society. In a discussion of the subject which followed, Sir ARTHUR NEWSHOLME said that in the United States very little was being done regarding factory hygiene from the governmental side. What was done was voluntary work by great industrial concerns where they realized that they were dependent upon the health and efficiency of the workers. In Great Britain there was some danger of welfare workers being regarded as a charitable institution, conferring benefits on the working classes. It was necessary to get rid of this idea entirely, as it was in the interests of the employer as much as the employed that the workers should do their work.

Mr. BARRON, a miner from Durham, said the one thing needed in the collieries at the present time was something that would relieve the suspicion existing between employers and employed. The truest economy was not the question of giving or receiving wages, but something that would make a man feel that he was more than a machine.

Sanitary Science and Preventive Medicine.—Sir LESLIE MACKENZIE, president of the section in Sanitary Science and Preventive Medicine, in his presidential address said that the new objective in preventive medicine was to produce fitness. This was one of the primary lessons of the war. If the signs of the times could be read, even in part, they seemed to indicate that in the coming years the races that constitute Great Britain would have to set themselves consciously and openly under the guidance of the best science, not merely to control great infections and otherwise to prepare a healthy environment, but also to equip each individual with the strength to produce and courage to endure. If we expected to maintain our pace in production, we must be quite clear that the duties of civilized living, if not so urgent apparently as the duties of war, were in the long run just as exacting and required for their performance the same high qualities of mind and body.

No more illuminating study in the whole range of public health was made during the war than the special investigation on industrial fatigue, bringing out just how the hours of labor, kind of food, character of work and general working conditions showed themselves in the form of increased or diminished output. During the past thirty years the drift had been from the study of environment to the study of individuals, and in medicine generally the drift had been from the study of end products to the incipient physiological deviations that need never become pathological. There was a dawning hope that in the years immediately before us the general public would have the benefit of the highest medical skill, informed by the latest medical science, by means of the improved organization of the whole forces of research and treatment.

Smoke Abatement.—PROFESSOR LEONARD HILL said that while coal fires were the cheapest source of radiant energy in luminous form required in our climate, the time spent in attending to it and the ill effects on health of smoke pollution made it the dearest.

Dr. J. S. OWENS, in an analysis of a London fog, said that to produce a dense smoke fog about four milligrams of soot to the cubic metre of air was all that was required. One milligram produced the ordinary winter haze. If a dense smoke extended over the whole of London and up to a height of four hundred feet, a trifle under two hundred tons of soot would be present. The domestic fires of London from six in the morning till nine at night produced over two hundred tons of soot, sufficient to produce one of the densest fogs.

The Effects of Environment on Output.—Dr. D. R. WILSON, secretary of the Industrial Fatigue Research Board, presented a summary of the results of the investigations made by the board of the effects of environment on output. In heavy work involving exposure to high temperatures, production, he said, underwent a persistent seasonal variation, being, with few exceptions, greater in winter than in summer. The opposite effect was suggested in light work, such as silk weaving. Good ventilation was found to neutralize seasonal

variations and was reflected in the evenness of output throughout the year. In silk weaving it was estimated that even good artificial light caused a reduction in output of ten per cent. compared with daylight.

Miners' Nystagmus.—Dr. D. LECHMERE ANDERSON presented a resolution, which was passed, that the home office should be urged to fix a standard refraction test for coal miners, with the object of diminishing the incidence of miners' nystagmus. It was possible, he said, to detect the primary symptoms of the disease in nearly twenty-five per cent. of the men engaged in the coal mines.

Personal and Domestic Hygiene.—The Mayoress of Folkestone presided at the meeting of the section devoted to a consideration of personal and domestic hygiene. In the course of her address she said that she had had many opportunities of seeing the necessity of increased cleanliness, both of the person and the home. She regretted, however, that the right people did not use the facilities at their disposal for personal cleanliness. With the provision of cheap public baths and of baths provided for in all the new housing schemes, personal cleanliness should not be a difficult matter. In the poorer houses, however, there was still a great lack of cleanliness, which was no doubt due to ignorance or laxity on the part of the mother. Much was being done in the schools today to teach the girls housewifery, cooking, and laundry work. This should have a beneficial effect. Much more might be done by the church agencies to bring obscure cases to the attention of the sanitary authorities, so that such persons might be visited and treated in the cleansing stations which all up to date authorities provided. She said that domestic hygiene was, to her mind, not a scientific subject, but might be summed up in one word—cleanliness. The later Sir Benjamin Ward once said that if by some magic spell England could wake up clean she would wake up pure in spirit and godly in the comprehension of godliness.

A general discussion on the hygiene of the home followed the reading of the main papers in this section. Dr. P. Jones, of Glamorgan, urged that the basis of public health in the future lay more in the direction of giving the people proper food than in providing nice houses to live in.

Dr. C. S. THOMPSON, of Hythe, suggested that in teaching children hygiene appeal should be made to their vanity. If a young girl was told that if she grew up with yellow teeth she would never get a husband she would begin at once to clean her teeth. He also said that the old idea that an expectant mother should be fed on stout in order that she would have plenty of milk should be suppressed.

Mrs. EVA FULLER, a member of the Dover town council, said she was of the working class and resented any suggestion that the working classes did not make the best use of their opportunities.

The Hospital as a Health Centre.—Mr. E. L. MARTYN LOBB read a paper dealing with the hospital as the primary health centre in relation to health service. He said that a health service should work for and secure the health of high and low,

rich and poor. More than that, health service must work to maintain health rather than to cure disease. "Public Health Is Purchasable," was the motto of the New York Health Department, he said. Given unlimited finance, an adequate health service would be a comparatively easy affair, but finance today was anything but unlimited. It would seem that the great renaissance of medicine which we were witnessing could hardly have occurred at a more inopportune moment. The hospitals said that they would not bear their present burdens, still less add to them, and municipal authorities, the public, and the ratepayers, while applauding the abstract idea of primary health centers dismissed it as a fantastic mirage, crying "not a penny from us." Medical practitioners viewed the scheme as an insidious attempt of socialistic dreamers to rob them of the little they might yet earn. It was certain that for many years to come we could not afford a perfect health service, but we could make a start with the facilities we had. As for hospitals, he maintained that better organization would relieve much of the pressure of crowded premises and long waiting lists. He hoped that the day of a sliding scale of payment by patients to a hospital was not far distant. Another abuse was that too many treatments were being given in hospitals which could just as well be carried out in the patient's home or in a convalescent home. It was time that a sort of doomsday book of England's convalescent accommodation was compiled and to every hospital, according to its size, a fraction of the available convalescent bed accommodation should be assured. Poor law infirmaries were empty to a large extent, and if the stigma of pauperism was removed from the name their doors might be thrown open to the hospitals for the accommodation of convalescent patients.

During the debate which followed, Doctor WHEATLEY, medical officer of health, for Shropshire, said he looked forward to a district nursing service trained in public health as a means of having many cases now treated in hospitals dealt with at home.

Doctor HANDFORD, of Nottingham, urged that hospitals must have more financial help from the insurance societies, a help to which they were morally entitled.

Mrs. PALMER, of Southampton, thought a State medical service was bound to come and the best organizations to control that service would be the already established health committees. Hospitals should concern themselves more with the prevention of disease and become centres of good health instead of centres of bad health and disease, as they were today. It was deplorable the number of medical men who failed to keep abreast of modern developments, and there should be research departments in connection with hospitals in which every medical man should be compelled to do a period of service. Although surgery had made great advances in recent years, medicine had made practically none.

Mr. ARTHUR F. WICKENDEN condemned the disregard of common sense principles in crowding

small houses with superfluous furniture and dust collecting bric-à-brac. When one took stock of the accumulation of pictures plastered over every available inch of wall space, one could solve for all time the problem of where the flies go in the winter time.

Miss AMY HUGHES said that there was need of a much wider education for parents. It was curious how many people accepted disease and ill health as inevitable and did not realize that a great deal of trouble could be avoided by following the rules of personal hygiene.

Letters to the Editors.

LITERATURE ON RESECTION OF THE TARSUS.

9 EAST FORTY-SIXTH STREET,
NEW YORK, June 17, 1921.

To the Editors:

I am in receipt of a reprint by Dr. Arthur S. Tenner, entitled Resection of the Tarsus and Conjunctiva, printed on March 16, 1921. This is the reprint of a paper read by the author before the Section in Ophthalmology of the New York Academy of Medicine, November 16, 1920, and published in your issue for March 16, 1921. I was present on the occasion of the reading of that paper.

In the references to the literature on the subject the author of the reprint and the reader of the paper on that occasion refers to H. W. Wootton and Hiwatari Kazuo alone. In the *Archives of Ophthalmology*, 1912, Vol. 41, p. 141, will be found an article by myself on the Resection of the Tarsus and Conjunctiva, with description of a clamp, whereby this operation can be performed practically in a bloodless manner. A cut of this clamp which I constructed, together with other illustrations showing the various steps of the operation as suggested by myself, can be found in that article. If one cares to refer to the paper by Dr. Tenner, he will observe that the cut of his clamp bears a striking resemblance to that which I invented, the difference consisting mainly in the presence of two spikes on Dr. Tenner's clamp and five on my own; likewise, he has at the end of his clamp a screw whereby the bar holding the spikes may be slid up and down.

Subsequent to the publication of a description of my instrument, a few months afterwards, Miss Ehrhart, a nurse at the New York Eye and Ear Hospital, had constructed a clamp, of which the one described by Tenner is almost an exact counterpart. Instead of the serrated teeth used by Miss Ehrhart, Tenner substituted the two spikes and in addition the aforementioned screw at the end of the instrument. To this Dr. Tenner makes no reference either in the paper as he read it or as it was printed in your journal. A description of Miss Ehrhart's instrument has not been published, I understand, but it is well known and has been used continually at the Eye and Ear Infirmary in resection of the tarsus.

A great deal depends on the matter of placing the sutures in this operation. I changed the method employed by Wootton in inserting the sutures, and

in my fourth conclusion stated as follows: "The line of the sutures is not at right angles to but is parallel to the border of the lid." Fig. 5 in my article will show this, and if the reader will refer to Fig. 3 in the article by Dr. Tenner, he will see that the stitches in the two cases are exactly alike. This may appear to be an insignificant matter, but it is not. Parallel sutures secure smoothness and complete adaptation of the conjunctiva to its new position in the lid, thereby preventing puckering.

It is usual, ethical, and proper, when one prepares a paper on a scientific subject, to acquaint himself with the literature bearing upon it, and all matters touching it. When questioned at the meeting before the section, Dr. Tenner disclaimed knowledge of these two instruments and said he was not well acquainted with my paper. My instrument was the first clamp invented for the performance of this operation. Any modification of that clamp or my procedures by anybody should have been attended by a reference to my paper and to the instruments constructed by myself and by Miss Ehrhart. Dr. Tenner disclaimed any intention, when the facts had been presented to him, of being disregarding of the proprieties or of taking credit from any one, nevertheless, in the publication in your journal, there is no footnote or postscript in support of his disclaimer.

It is unnecessary before ethical men to dilate upon the proprieties in such manners, but it is just, right, proper and imperative, that credit should be given where it is due, and that no one should take the ideas or appropriate the efforts of others in exploiting his own endeavors. If all men insist strictly on the enforcement of such principles, much confusion will be avoided and subsequent generations will not be confounded by different claimants to priority. Witness in this connection, the contention in regard to the introduction of ether in the practice of medicine as an anesthetic.

The Scripture has said that ignorance is no excuse, the assumption being that the means of information are at hand. Dr. Tenner refers to the paper of Dr. Wootton in the *Archives of Ophthalmology* in 1910. My paper was published in the *Archives of Ophthalmology* in March, 1912. Dr. Tenner evidently had the means of information at hand.

J. H. CLAIBORNE, M. D.

CHICAGO, June 9, 1921.

To the Editors:

Dr. A. S. Tenner's favorable report of Tarsus Resection in Trachoma published in the *NEW YORK MEDICAL JOURNAL* for March 16, 1921, seems hardly to represent correctly its status in the United States and Egypt. He asserts that "the American literature on the subject is exceedingly scanty" and refers to "Wootton's classical paper (1910)" as if it were the first to be published in this country. In justice to my colleague, Dr. Casey Wood, now in Europe, I feel compelled to remind Dr. Tenner and others that not only were the Heisrath procedure and all its modifications carefully described, thoroughly discussed, and well illustrated, but a voluminous literature on the subject appeared many

years before the appearance of Wootton's paper in 1910.

It is well known that Dr. Wood was the first one to introduce this subject to English readers and he has in several journals and before a number of societies asserted its extreme value in certain forms of trachoma, reporting numerous instances of relief in intractable cases, with accompanying histories, illustrations of instruments, and description of technic. His earliest paper was published in 1898 in the *Annals of Ophthalmology* (page 372); another in the *American Journal of Ophthalmology* in July, 1903; still another in the *Practical Medicine Series* for 1913. Finally, the whole matter is fully thrashed out (including an abstract of Dr. Wootton's "classical paper (1910)" in the *American Encyclopedia of Ophthalmology* under the caption Trachoma.

Dr. Tenner should also read Dr. A. F. MacCallan's (Cairo) approval of this method, published some years ago and mentioned also by Dr. Wood in his well known report of two trips to Egypt appearing in the *Ophthalmic Record*.

After all, nothing really worth while has been added to the experience and observations of Jacobson, Heisrath, and Kuhnt in this matter. It was, as Dr. Wood clearly pointed out, chiefly to the last named that we are indebted for the improvements in a measure that the two former observers were instrumental in giving to the surgical world.

FRANK ALLPORT, M.D.

A MANUFACTURER'S PROTEST.

CINCINNATI, OHIO, July 28, 1921.

To the Editors:

Our attention has been called to statements appearing in a number of professional journals which might lead some physicians to believe we had discontinued the manufacture of proteogens. Such is emphatically not the case.

In order to keep up with the tremendous strides that are being made in biochemistry and to keep our nonspecific protein products, known under the registered trade name of proteogens, well in advance of other products, we have recently reorganized our biochemical laboratories.

As a result of this reorganization the name of Horovitz no longer appears on the labels and literature of our products. The present state of perfection of proteogens is due entirely to experimental work in our own laboratories, where under expert supervision these products are being further improved. The research work connected with the development of proteogens is now in charge of an American biochemist of unquestioned reputation and highest scientific standing.

We trust, therefore, that the pharmaceutical and medical professions will not be misled by any false claims. The nonspecific vegetable protein solutions originally supplied in ampoules under the name of proteogens are manufactured by the Wm. S. Merrell Company. You are urged, therefore, to insist upon receiving original sealed packages bearing the name of this company and the registered word proteogens.

WM. S. MERRELL COMPANY.

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NEW YORK, WEDNESDAY, AUGUST 17, 1921.

Miscellany.

Experiences of the Child.—C. Macfie Campbell (*Mental Hygiene*, April, 1920) states that it is time to eliminate the mystery attached to taboo. The child as he develops has of course to outgrow the more primitive reactions, subordinating them to the more mature and socially important reactions. The child can, however, be encouraged to outgrow primitive reactions without giving to them false values; he can learn frankly how more mature values supersede the less mature, but he can do this while still realizing that his native promptings and questionings are the real stuff out of which his life is to be made, and that they are all fit to be subjects of honest scrutiny and of trustworthy information.

Nonrheumatic Aortic Stenosis in Young Subjects.—Gallavardin (*Presse médicale*, March 19, 1921) refers to the occurrence, usually in young individuals, of a form of aortic stenosis with clear-cut physical signs which neither corresponds to what is now known of congenital aortic stenosis nor is of arterial nonrheumatic origin. As a rule, the stenosis is quite uncomplicated; where accompanied by slight regurgitation it always remains distinctly predominant. Clinically, this form of stenosis is well tolerated for a prolonged period; it may, however, in its advanced stages be associated with disturbances of function, and in some instances developmental disturbances have been reported. The origin of the disorder is in doubt. In a few cases, possibly, it consists in a congenital lesion which is revealed late; but in the majority of cases it appears rather to be an acquired lesion, developed slowly during childhood or adolescence on account of a subacute or chronic endocarditis, due to some as yet undetermined factor. The several features of this disorder warrant comparison of it with the mitral stenosis of Duroziez.

Manganese in Pediatric Therapeutics.—Camescasse (*Presse médicale*, March 19, 1921) refers to certain children who, in spite of having been kept for a time in the country, remained subnormal in body weight. The weight showed a notable increase and the general condition improved upon administration of manganese dioxide in a daily dose of 0.03 to 0.07 gram.

Destruction of Fleas.—Loir and Legangneux (*Journal de médecine de Bordeaux*, March 10, 1921) recommend the solution of 300 grams of soap in 1500 grams of water, followed by the addition of eight litres of coal oil. An emulsion is made by shaking the mixture. Just before use, one part of this emulsion is poured into twenty parts of water. The resulting mixture is applied over the woodwork and poured between the cracks in the flooring. For protection of the person against flea bites oil of cloves and tincture of cevadilla are serviceable.

Studies on Measles.—Francis G. Blake and James D. Trask (*Journal of Experimental Medicine*, May, 1921) describe a series of reinoculation experiments in monkeys which had recovered from a previous attack of experimental measles. It was found that one attack of experimental measles apparently conferred a complete immunity against reinfection for at least a considerable period, and in all probability, permanently. This was true whether the virus of measles was of homologous or heterologous origin. In this respect experimental measles in the monkey corresponds with measles observed in human beings.

Syphilitic and Familial Graves's Disease.—Leredde and Drouet (*Presse médicale*, March 16, 1921) refer to the case of a woman in whom exophthalmic goitre set in during the war after she had been greatly alarmed by an airplane raid. Three other cases of Graves's disease are known and three more believed to exist in the same family. In the four cases actually under observation the Wassermann reaction was negative, but the Hecht reaction, tested in the first patient, was positive at first and later became negative under treatment. The tachycardia and palpitations disappeared under novarsenobenzol therapy, but lumbar puncture yielded a still positive Wassermann reaction in the cerebrospinal fluid. The case is thus believed to be one of syphilitic exophthalmic goitre due to syphilis in the second generation.

Complement Fixation Test in Tuberculosis.—A. L. Punch (*Lancet*, September 25, 1920), basing his studies on the work of Wassermann and Bruch, has investigated the complement fixation abilities of the blood of tuberculous patients, with the view of finding a definite test for the presence of tuberculous lesions. He uses an emulsion of tubercle bacilli as antigen, in three dilutions. The author concludes that: 1. The complement fixation test specifically indicates the presence or absence of an active or recently active lesion. 2. A positive reaction in the highest dilution of the complement used is as reliable an indication as positive reactions in the other dilutions. He believes that positive reactions in the case of arrested tuberculosis are due to the persistence of antibodies in the blood.

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WHOLE No. 2216.

Peritonitis*

By JOHN B. DEEVER, M. D.,
Philadelphia.

I am not aware that I can offer anything new on the subject of peritonitis, but I believe that it is one of such vast importance that it does not suffer from being repeated from time to time, even though its most salient features are probably familiar to us all. I will not discuss the microscopic anatomy of the peritoneum as to the presence or absence of stomata, nor will I discuss whether the peritoneum is a part of the lymphatic system or not; this is really only of academic importance. What we want to know is that the peritoneum has great absorptive and exudative power.

THE PERITONEUM.

The peritoneum, by its folds, convolutions and fossæ, is without doubt the most extensive serous membrane of the human body, covering as it does an area almost equal to that of the skin. It is a complex sac containing several diverticula and the hollow and solid viscera, the latter projecting into the cavity but being shut out of the cavity proper by their serous covering of peritoneum, the visceral layer. Its function is mainly protective, in that it provides a surface which permits free play upon each of the other organs which it covers, the proper degree of lubrication being maintained by its remarkable powers of exudation and absorption, the chief characteristic of the peritoneum. One of the most important factors in peritoneal absorption is the vitality of its endothelium represented by a single continuous layer of delicate, flat, endothelial cells, by virtue of which the peritoneum remains a cavity in spite of its folds and undulations. Normally the equilibrium between exudation and absorption is so well balanced that there is never an excess of fluid in the peritoneal cavity, therefore the presence of even a small amount of free fluid must be taken as an indication of the presence of some pathological process. It is also owing to these same phenomena that protective temporary adhesions are formed in the peritoneum by which its surfaces adhere to each other when irritated by a reactive process, and which leads to the familiar walling off of the affected area that prevents the diffusion of the infection, for peritonitis is always due

to bacterial infection. Aside from the very rare cases of so-called chemical and idiopathic peritonitis, which probably represent a hematogenous or lymphatic infection, the most important source of infection in peritonitis is directly from some intraabdominal organ, mainly the appendix, the intestines, the female internal genital organs, the stomach, and the gallbladder, the result either of trauma or disease or both.

TYPES OF PERITONITIS.

The question of chemical and mechanical peritonitis is one around which considerable discussion has always centred. The term chemical peritonitis, according to Murphy, is a convenient one for those instances in which typical peritonitis is produced by the introduction of presumably sterile substances into the cavity, such as the contents of a ruptured ovarian cyst, or some chemical, either foreign or coming from adjacent viscera. At bottom, however, I am inclined to believe that this form of peritonitis is infective, inasmuch as the excoriation of the endothelium prepares the way for the entrance of pathogenic bacteria, in the same way as the twisting of a pedicle of a tumor, the presence of a foreign body, such as a sponge, with the resulting reddening and exudation, represent what may be termed a mechanical peritonitis by preparing the way for the bacteria to gain a foothold in the peritoneum.

The first effect of the bacterial invasion is a hyperemia with exudation into the subperitoneal tissue of the part around the infected focus, soon followed by exudation of fluid into the peritoneal cavity. This fluid is at first protective and bactericidal in character, but by impairment of its vitality it is gradually converted into pus, the rate of the conversion being dependent upon the degree of intraabdominal tension, the virulence of the infecting organism and the individual power of resistance.

It is well known that the presence of practically any foreign substance is capable of producing irritation in the peritoneal cavity. Blood, bile, and urine, even if not infected, will excite an inflammatory reaction, the two last named being especially irritating; when present they interfere with intestinal function and damage the walls of the intestine and thus favor bacterial invasion of the peritoneal

*Read before the Philadelphia County Medical Society, March 9, 1921.

cavity. In the presence of a perforating viscus the bile and urine may already be infected and their extravasation into the peritoneal cavity will set up an infective and irritative peritonitis. Such double peritonitides result, for example, from perforations of the stomach, duodenum and gallbladder in which bile and activated pancreatic secretion play a part. Peritonitis from the lower intestinal tract and the female pelvis is also infective and bacterial in nature.

EXUDATION AND ABSORPTION.

Whatever the source of the irritation or the inflammation, the result is abnormal activity of the phenomena of exudation and disturbance of the rate of absorption. From the results of extensive and careful experimental work we know that absorption takes place through the lymphatics or through the blood stream and in this way bacteria and their products are distributed to the lymphatic tract and the circulation, while at the same time there is an excess of serous exudation in the peritoneum. Absorption takes place through the lymphatics and the bloodvessels, both fluid and soluble substances being absorbed by both sets of vessels, while acid substances (bacteria, foreign, animal cells) are absorbed almost, if not quite, exclusively through the lymphatics. Absorption by the blood stream constitutes one of the greatest perils of peritonitis. On account of the wonderful absorptive power of the peritoneum it makes its own toilet. Early in the process, unless the exciting organism is one of great virulence, the resistance of the body and particularly the protective powers of lymph and of phagocytic leucocytes assist in inducing more or less prompt absorption. But the protective properties of this early turbid peritoneum fluid are lost soon after the serous and seropurulent stages of exudation are passed, and the damaged peritoneal membrane responds by depositing a fibrinous material rich in leucocytes, and thick and tenacious. The effects of this deposit is cofferdamming the lymph and bloodvessels and cementing the adjacent peritoneal structures together, thus shutting off and isolating areas which are so highly infected as to interfere with absorption and the bacterial action of the exuded fluid.

The infective process may go on within this walled off area, while the general cavity remains protected against its spread. It stands to reason, therefore, that the essential feature in the treatment of peritonitis is not to interfere with the walling off or localization process and to avoid any measures that favor its diffusion. Murphy, in his classical paper on peritonitis, aptly compared the rôle of fibrin in the peritoneal cavity to the action of a board of health in protecting a community by isolating infected individuals.

Diffusion, we know, is increased by general bodily activity and movements of the diaphragm, and that reduced respiratory force and peristaltic movements are Nature's way of preventing diffusion. Practically we make use of this knowledge by putting the body at complete rest and by means of proper posture encouraging the gravitation of the noxious fluids to the lower and less dangerous portions of the peritoneal cavity. It is a well known

fact that peritonitis arising from lower areas of the peritoneal cavity are less serious than those coming from the upper zones, because the greater activity of absorption in the diaphragm in the upper portion favors diffusion. The rhythmic pumplike action of the diaphragm, in action day and night like the heart, is one of the most important factors in aiding peritoneal absorption, its alternating contraction and relaxation being instrumental in sending onward fluid and particles aspirated from the peritoneum. In addition to this, peristaltic activity is of equal importance in that it favors an even distribution of fluids and prevents their accumulation in the pelvis toward which they naturally gravitate.

QUESTION OF BACTERIAL FLORA.

As to the question of bacterial flora in peritonitis, it is today generally recognized that it nearly always is a mixed one, the most important organisms being the staphylococcus albus, colon bacillus, streptococcus, pneumococcus, typhoid bacillus and gonococcus.

Great stress is laid on the protective influence of the staphylococcus albus which, according to Dudgeon and Sargent, is the first to appear and the last to disappear in peritonitis of intestinal origin, and whose presence in conjunction with other organisms influences prognosis. In the presence of abundant phagocytes and staphylococci at a site distant from the focus of infection the prognosis is favorable; it is grave but not hopeless if some bacilli are associated with these organisms, and very grave if only a few phagocytes, few staphylococci and numerous bacilli or streptococci are present.

The importance of the colon bacillus is generally recognized, although the idea that every peritonitis of intestinal origin is due to this organism exclusively is not supported by facts. The error is probably due to the well known rapidity with which the colon bacillus increases and its tendency to overshadow the other associated organisms.

STREPTOCOCCIC PERITONITIS.

Streptococcic peritonitis occurs more frequently in women than in men because of the greater frequency of that organism in pelvic infections of the female. When due to pelvic inflammation, as in puerperal infections, this streptococcic inflammation is a retroperitoneal phenomenon, and is familiarly known as concealed erysipelas. A form of streptococcic infection of the peritoneum is occasionally reported in which the peritoneum becomes involved without concomitant involvement of any of the abdominal viscera. The route of infection in these instances is by way of the blood stream, the source being acute inflammation of the nasopharynx, particularly the tonsils. The relationship of this type of peritonitis and streptococcic epidemic sore throat has been suggested by observations made during recent epidemics of this character. The cases observed show a tendency to affect females, especially among children, rather than males. Pneumococcic peritonitis is not common, although cases are being reported with increasing frequency. It is a fatal form of infection, and occurs more often among female children than among adults.

Sometimes pneumococcic peritonitis arises secondarily to pneumonia. According to Hertzler, this

occurs in one per cent. or less of all pneumonias, and it also affects little girls more often than boys and children more frequently than adults, the sex incidence of the latter being about equal. Gonococcic infective peritonitis is probably the most clearly defined type of inflammation originating as it generally does from an infected Fallopian tube and being marked by sudden stormy onset and early localization in the lower abdominal cavity, usually at one side.

PERFORATION.

By far the most frequent avenue by which the peritoneum becomes infected is from perforation of some intraabdominal viscus—the most common, of course, being the appendix. But, whatever its origin, the symptoms of peritonitis have much in common. In the order of their occurrence these symptoms comprise pain, vomiting, fever, distention, and rigidity. The pain, especially in the presence of perforation, is sudden and severe, its intensity varying somewhat according to the organ involved and its pathological condition.

SYMPTOMS.

In appendicitis, for example, the most common source of peritonitis, the initial pain is very severe, owing to occlusion of the appendicular artery and beginning necrosis, but later, when necrosis is complete, the pain loses its severity, indeed it may subside altogether. This subsidence without doubt is the most serious of the many insidious features of nearly all types of peritonitis, more particularly, however, of appendicitis. The false security aroused is responsible for many of the fatal cases of acute appendicitis.

The initial pain is often accompanied by a chilly sensation or a distinct chill, and in case of perforation is soon followed by primary reflex nausea and vomiting and the typical reflex rigidity and exquisite tenderness of the abdominal muscles, the latter being usually more marked over the seat of the trouble; the picture of the patient, with thighs drawn up, shoulders high, and superficial and costal respiration, is too familiar to need more than passing mention. It evidences the fact that much of the pain is due to friction of one diseased part against the other, and represents an involuntary act of protection against such contact. The pulse is rapid, small, thin and wiry.

The temperature at first is low, especially in the presence of a large perforation, but it very soon rises to considerable height. The temperature, however, is not of much diagnostic or prognostic value. The vomiting is often interpreted as Nature's effort to throw off the toxins absorbed by the gastrointestinal tract. It is well to aid the process by the use, not of purgatives, but of gastric lavage. The abdomen usually becomes distended and tympanitic. In the fatal cases the patient shows all the distressing signs of general toxemia until relieved by death.

DANGER OF PURGATION.

The danger of purgation in acute abdominal conditions is one that cannot be too frequently emphasized. While it is true that the practice is on the wane among physicians, it nevertheless is still en-

tirely too common among the laity, and it is the manifest duty of a general body like the County Medical Society to spread effectual propaganda on this subject. About sixty per cent. of my cases of acute appendicitis at the Lankenau Hospital give a history of purgation, and of these about seventy-two per cent. are complicated by pus, abscess, gangrene or perforation, and in many instances a combination of these catastrophes.

There are, of course, some cases, fortunately few, in which the virulence of the infection is such that nothing that can be done is of avail, and at the other extreme there are mild cases in which the inflammation is transitory and will subside with or without treatment, with or without leaving any trace of its presence. But it is impossible to tell which of such cases will or will not subside, for so much depends on the degree, and the type of infection. While the peritoneum can take care of a moderate number of virulent organisms, their presence in numbers beyond the limit of tolerance may result in a dangerous peritonitis, and if eventually perforation and gangrene develop the disaster is complete.

LOCALIZATION OF INFECTION.

The localization of the infection is also important because, as is well known, infections of the pelvis, the lower abdomen, are less serious than those of the upper abdomen, and infection involving the margins of the peritoneal cavity are not so dangerous as when the infection is central and the coils of the small bowel are involved. The folds of the peritoneum and the mesenteries play a part in limiting the peritoneal inflammation and directing its spread. The most potent protective agent in this respect is the great omentum, which stands guard, and at the first sign of danger wraps itself around the inflamed areas and endeavors to protect them against slow perforation, shuts out purulent collection, and aids in absorption and exudation.

In the absence of injury to the endothelium, bacteria and foreign substances will, within limits, be safely disposed of by the lymphatic route, but danger to the endothelial cells permits absorption by the vascular route. The uninjured hands, for example, may be soaked in virulent material with comparative impunity, but if there are abrasions, epidermis being denuded, infection is almost sure to follow. Similarly, in the peritoneum, among the factors favoring absorption are abrasions or exfoliation of the endothelium, tearing of peritoneal adhesions, and consequent exposure of the underlying vessels.

If the picture of peritonitis as we know it was of the early stage of the disease the question of treatment would be much simplified; but the classical picture is that of the disease in a more or less advanced stage, and there enters the question of when to operate. Peritonitis is seen either as a circumscribed or diffused inflammation. The terms diffusing, general, universal, are nothing more than advanced stages of the diffused variety, therefore should not be used, as they only tend to confuse. In a diffuse appendiceal peritonitis, with no definite point of localization and with peristalsis absent, the question of operation was at one time a difficult matter. But with the recognition by Ochsner, Murphy, Fowler and their followers of the value of

complete rest and the institution of the now generally accepted treatment which bears their names, the question of when to operate is more easily decided.

TIME OF OPERATION.

There is, I am aware, a certain class of surgeons who boast of operating in every case of acute appendicitis no matter at what stage it may be. I have expressed my opinion of this procedure on numerous occasions, and will here repeat that he who operates in a case of acute diffusing peritonitis after the first thirty-six or forty-eight hours of the onset of the peritoneal inflammation with no evidence of a localizing point is, in the majority of cases, not serving the best interests of his patients, nor his own best interest either, nor that of the profession. Operation at an indiscreet time in the presence of diffused peritonitis and in the absence of a localizing point, liberates toxins which are the cause of death in these cases. Although occasionally a patient may get well in spite of precipitous and ill advised operation, the operative mortality in these cases is sure to be a high one. Success in this type of surgery, I cannot help thinking, is much a matter of luck—no matter how skilful the surgeon. Judgment is as indispensable to successful surgery as is skill.

In the presence of a circumscribed peritonitis with a localizing definite point of exquisite tenderness, due to an acutely inflamed, perforating or gangrenous appendix, operation can be undertaken, in the absence, of course, of constitutional or other contraindications, provided the proper technic is observed with respect to safeguarding the peritoneum from contamination by the proper disposition of gauze packings. After removal of the appendix, the operation can be completed by providing for drainage and closing the wound up to the point of exit of the drainage or by not closing the wound at all. In cases of abscess treated as open wounds which have already filled in, it is not my practice to suture. While this may and usually does lead to a subsequent hernia, I believe, nevertheless, that it is better to repair the deformity when the tissues have recovered their normal vitality.

SEVERE INFECTION.

In badly infected cases where the peritoneum in the immediate neighborhood of the lesion is green and there is foul smelling pus, the infected cavity should be surrounded by a rubber dam or oiled silk, and lightly packed with gauze; the wound is left open but silkworm gut should be carried through the margins of the wound and tied loosely to prevent protrusion of the intestines. The packing should be allowed to remain in for several days before being removed. If in addition to the cofferdamming, rubber drainage has been placed in the subhepatic space, or between the diaphragm and the liver, and a glass or rubber tube placed in the pelvis, the latter should be removed when aspiration yields a straw colored fluid. If, at the end of twenty-four hours, the glass or rubber tube contains pus, if glass it should be replaced by one of rubber carried down into the pelvis through the glass tube and the latter gently withdrawn by revolving it around the rubber tube; if rubber, it should be left in. At

the end of four to six days the rubber tube can be gradually withdrawn, cutting off the projecting end a little at a time until it is entirely removed. Before the cofferdam is removed it should be soaked several times daily with hypertonic salt solution and also during its removal. This policy is best to pursue in cases of peritonitis where the assumption is reasonable that the trouble has its origin in the appendix, or the lower abdomen; but where the symptoms indicate perforation of one of the larger viscera, such as the stomach or the duodenum, immediate operation is urgent. Peritonitis, the result of intestinal obstruction, gastric, duodenal, gallbladder, intestinal or colonic perforation, should be immediately operated upon if the condition can be recognized, which it usually can if the case is seen early. The longer the peritonitis exists, other things being equal, the more grave the outlook. Peritonitis is dangerous directly in proportion to absorption. It is not the inflammation of the peritoneum that is fatal, but the toxins which are absorbed from its products that cause the severe manifestations or perhaps death. It is true that severe peritonitis of several hours' duration often masks the situation so completely that differential diagnosis may be impossible. Nevertheless, a carefully taken history will generally be of the greatest aid. By far the vast majority of cases of perforating gastric or duodenal ulcer give a previous history of digestive disturbance, while if the gallbladder is at fault it is almost sure to have been preceded by indications of cholecystic disease, either calculous or noncalculous.

POSTOPERATIVE TREATMENT.

Postoperative treatment differs little from operative. Purgation here is as ill advised as before operation. The lower bowel can be emptied by a gently given enema. The upper bowel will take care of itself and will begin to empty as soon as nourishment is given, which can be done as soon as the passing of flatus indicates the subsidence of the storm, and peristalsis is restored. The quiescence of the intestine is a prime factor in bringing about early circumscription of the process by adhesions.

Too thorough operation in peritonitis very often spells death. Peritonitis is dangerous directly in proportion to the absorption. It is not the inflammation of the peritoneum that is fatal, but the toxins which are absorbed from the products of the inflammation that cause death. In cases where it is necessary to prolong the fasting period beyond forty-eight hours nourishment must be provided by means of nutrient enemas, according to the judgment of the individual surgeon or practitioner, that is, adding nutriment to the salt solution.

1634 WALNUT STREET.

Determination of the Acidity of Gastric Contents.—Alfred T. Shohl (*Bulletin of the Johns Hopkins Hospital*, May, 1920) states that in order to determine the acidity of gastric contents by methods based upon sound principles one must consider acidity in terms of ionization and hydrogen ion concentration. The expression of gastric acidity in terms of pH (hydrogen ion concentration) will bring out clearly the relation between acidity and peptic digestion.

Surgical Conditions of the Stomach*

By JOHN J. GILBRIDE, A. M., M. D.,
Philadelphia.

Ulcer and its complications are the most common surgical conditions of the stomach. The three outstanding essentials in the surgical treatment of gastric ulcer are, first, the selection of the cases for operation; second, the technic of the operation, and, third, the aftercare of the patient.

The treatment of acute peptic ulcer of the stomach belongs to the internist. In the first place, it goes without saying that one must be certain so far as possible that the diagnosis is correct. Many cases that were thought to be gastric ulcer proved on further investigation to be duodenal ulcer, cholelithiasis, or not infrequently chronic appendicitis. It has also been shown that gastric ulcer is not as common a disease as was formerly believed. In many cases one cannot make an absolutely positive diagnosis of peptic ulcer on the clinical findings alone, but these must be corroborated by the x ray or by operative findings. It has been stated that more mistakes have been made in the diagnosis of gastric ulcer than in any other abdominal disorder. Duodenal ulcer occurs two, three or four times as often as gastric ulcer; cholelithiasis occurs even more often than duodenal ulcer, differing in frequency according to different authors, and it is not an uncommon experience to see patients, whose symptoms and laboratory findings are suggestive of gastric ulcer, subsequently suffer from an acute attack of appendicitis which when followed by operation usually results in a complete cure of the gastric symptoms.

About ten per cent. of the cases of gastric ulcer are penetrating ulcers, usually into the liver, spleen, or other surrounding structures.

The first case of this type that I ever saw was in a cadaver, in which the ulcer was of the lesser curvature of the stomach, circular, craterlike, measuring about three inches and a half in diameter. The wall of the glass was formed by the under surface of the liver to which the stomach was strongly adherent. Eggleston says that penetrating ulcers are usually diagnosed only by the use of the x ray, but their presence may be suspected by certain clinically distinguishing features of pain of greater severity, greater local tenderness, and absence of relief from the administration of alkalis. When the stomach is empty and peristalsis is more or less at rest these patients may be quite free from pain or other symptoms suggestive of adhesions.

Repeated hemorrhage is a condition demanding surgical intervention and for its arrest a simple gastroenterostomy may be sufficient, but in some cases it is also necessary for one to deal locally with the ulcer in conjunction with the performance of a gastroenterostomy. In about twelve per cent. of the cases of gastric ulcer gross hemorrhage or macroscopic blood occurs. In over eight per cent. of

cases of gastric ulcer with a history of hemorrhage before operation, there is a history of hemorrhage following the operation. The best method of dealing with the ulcer is to excise it and then perform a gastroenterostomy. Hemorrhage has occurred after infolding of the ulcer. Hemorrhage in these cases may occur months or even years after the operation. In the selection of cases for operation the best results are obtained in those cases where medical treatment has been tried, but has failed to effect a cure.

Many cases of ulcer of the pylorus, in which there is a swelling producing a moderate grade of obstruction, yield promptly to medical treatment. I have found the Sippy treatment very satisfactory and cases that respond usually do so within a few days. As an illustration of the improvement which takes place in patients with pyloric ulcer and in those in whom the obstruction and the other symptoms were severe enough to demand operation after the performance of a gastroenterostomy the pylorus frequently becomes patent and functionates properly. In some cases the stoma formed at operation becomes nearly closed and in other cases the gastroenterostomy produces symptoms which demand restoration of the normal condition by taking down the gastroenterostomy. As stated, many cases respond in a few days to medical treatment, but if it is deemed advisable to continue medical treatment a few weeks should decide as to whether surgical intervention is required.

So far as rectal feeding is concerned, I think the theory was exploded years ago and it has been proved conclusively that nutrition cannot be maintained in this manner. Fluid is supplied to the body but that is all. The Einhorn tube is both serviceable and practical. May the starvation treatment never return. Chronic ulcer of the stomach which has been treated medically without success should be operated upon. As to the diagnosis of ulcer of the stomach, William J. Mayo says that the x ray gives a correct diagnosis in about seventy-one per cent. of the cases, and that clinical diagnosis is correct in about seventy-one per cent. of the cases.

It is difficult to determine the frequency with which gastric ulcer undergoes malignant degeneration. Wilensky and Thalheimer made serial sections of gastric ulcers that had been diagnosed benign after a single section had been examined and found many of these to be malignant. Aschoff points out that if the lesion is cancer originally the base of the ulcer will prove to be cancer, while Wilson and MacCarty have shown that in cancer on ulcer the cancer existed in the overhanging edge of the ulcer and not in the base.

A new symptomatology must be written for gastric carcinoma. The old one of vomiting of coffee ground blood, emaciation, cachexia, glandular enlargement, including the wrong notion about the age of after forty, will not do. The laboratory findings also are mostly the findings of long standing

*Part of an address delivered before the Lancaster County and City Medical Society, Lancaster, Pa., November 3, 1920, and before the York County Medical Society, York, Pa., March 3, 1921.

disease, namely, the presence of lactic acid, Oppler Boas bacilli, etc. When all these are present one can be certain that the diagnosis is malignancy, but that does not do the patient any good.

The same thing is true in the findings of gastric and duodenal ulcer. For I doubt if there is any surgeon who is at the present time influenced to any great extent by the presence or the absence of hydrochloric acid in the gastric contents. The only practical thing that we can see at the present time that will enable us to get cases of cancer of the stomach earlier is the early use of the x ray. The only treatment that offers any hope for the patient with cancer of the stomach is the removal of the growth and the invaded lymphatics, as gastroenterostomy is only a palliative procedure, good, of course, when one is unable to do anything better. There is one other point about the use of the x ray which I think is necessary, not only in cases of cancer of the stomach but in cancer of other organs as well, and that is, that other parts in which metastasis is likely to occur should also be included in the picture, as it would not be worth while to operate for the removal

of a malignant growth when metastasis has occurred. Patients with cancer of the stomach may be improved considerably by preoperative treatment for a few days or even longer by forced feeding with milk, raw eggs, thin gruels and possibly by the addition of small amounts of whiskey. Cancer of the pylorus rarely produces complete obstruction, therefore, a liquid food usually passes through the pylorus.

The treatment after the operation is also important, as these patients usually have been on a starvation diet, and sometimes either through lack of liquids or from vomiting the tissues have become dehydrated, which also affects other excretions and secretions. Feeding should, therefore, begin after the operation as soon as the stomach becomes retentive. If the stomach is not retentive gastric lavage should be resorted to until it is retentive. It is my practice to begin giving nourishment in the form of albumen water within twelve hours after the operation. The quantity of food is gradually increased according to toleration by the patient.

1934 CHESTNUT STREET.

The Action of Various Salts and Other Substances on the Liver After Their Introduction Into the Duodenum*

Second Series.

By MAX EINHORN, M. D.,
New York.

In a paper recently published (1) it was shown, as first stated by Lyon, that magnesium sulphate when injected into the duodenum, usually provoked a color reaction in the bile. The reaction in most instances takes place gradually, reaches an acme of color intensity (becoming very dark), then step by step diminishes, returning to a light yellow. The dark bile did not appear to be real gallbladder bile as Lyon assumed, for the following reasons:

1. If the color change of the bile was due to the action of the magnesium sulphate on the gallbladder causing an emptying of its contents, the change of color would necessarily be an abrupt one, beginning and ending sharply. This, however, is not ordinarily the case.

2. Magnesium sulphate, which is believed by Meltzer to relax Oddi's sphincter and by Lyon to cause the emptying of the gallbladder, would in this way have no direct effect on the character of the bile evacuated. Solutions of twenty-five per cent. or ten per cent. of magnesium sulphate would, if the emptying of the gallbladder is accomplished, furnish a bile of identical color and other qualities. This, however, is not the case, the stronger the magnesium sulphate solution, the darker the color and the higher the specific gravity of the bile, indicating that the magnesium sulphate has a direct influence on the bile itself.

3. A great many other salts (which have no relaxing action) like sodium sulphate, bicarbonate of soda, and other chemicals, act in a manner similar to that of magnesium sulphate, effecting the color reaction named above. The latter must be due to the action of these ingredients on the liver and the bile production, and not to a mere evacuation of the gallbladder contents.

4. After applying the magnesium sulphate test, an immediate repetition of the test frequently provokes a reiteration of the same reaction with its entire series of color plays. If the dark bile would be gallbladder bile, the reaction could not take place anew right after the gallbladder had emptied its contents.

5. Patients whose gallbladders have been removed frequently give similar reactions after magnesium sulphate instillation, clearly showing that the gallbladder as such can have nothing to do with this phenomenon of color changes in the bile.

Although the mentioned arguments are quite clear, it appeared worth while to repeat some of the given experiments and to increase their number in order to substantiate this view. This the more so as the power of the magnesium sulphate to evacuate the gallbladder contents is generally accepted among the profession.

The studies on the action of salts and other substances on the liver after their introduction into the duodenum have been repeated and amplified. Be-

*Read before the American Gastroenterological Association at Boston, Mass., June 7, 1921. (From the Lenox Hill Hospital.)

sides magnesium sulphate, sodium sulphate, sodium citrate and magnesium citrate, bicarbonate of soda, chloride of sodium, calomel, mercurchrome and a great many other substances have been added to the list of drugs used in the investigations.

The method used was identical with the one

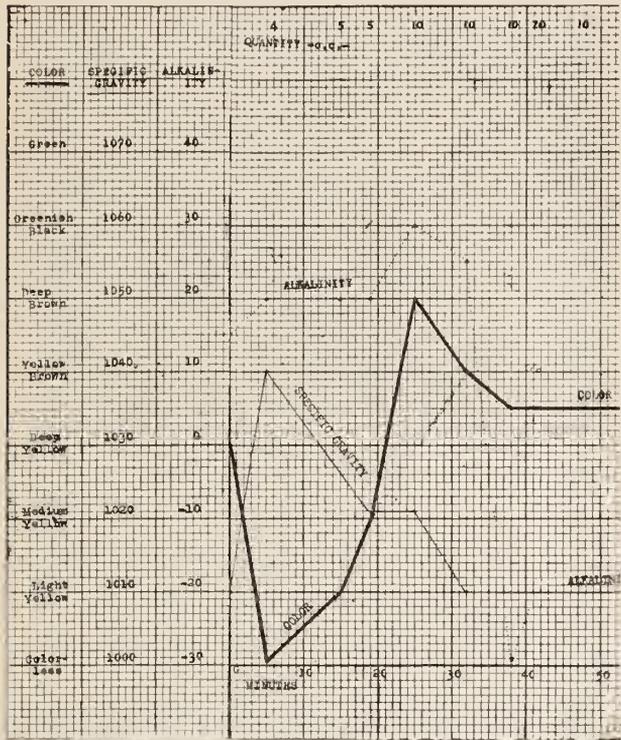


FIG. 1.—Mr. J. G. B. Magnesium sulphate twenty-five per cent., March 8, 1921.

described in the former paper, instilling a sixty c. c. solution of the desired salt or some other ingredient into the duodenum at blood temperature and then syphoning it back by gravity.

In the following cases the new investigations will be given in concise form, with a few graphic representations:

CASE I.—J. G. B., a patient with duodenal ulcer and chronic cholecystitis, had a complete series of different salts and other chemical ingredients instilled into the duodenum, so that a comparative study can be easily made. All these tests are briefly sketched and graphs given.

TEST I.

March 8, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, orange yellow, very turbid; 10 c. c.; alk. = 15; s. g. = 1010.
2. After six minutes clear and watery; 4 c. c.; alk. = 20; s. g. = 1040.
3. After fifteen minutes light yellow, clear; 5 c. c.; alk. = 20.
4. After nineteen minutes shade darker yellow, clear; 5 c. c.; alk. = 20; s. g. = 1020.
5. After twenty minutes shade darker yellow; clear; 5 c. c.; alk. = 25.
6. After twenty-five minutes dark brown yellow, clear; 10 c. c.; alk. = 30; s. g. = 1020.
7. After thirty-two minutes lighter brown yellow, clear; 10 c. c.; alk. = 25; s. g. = 1010.
8. After thirty-eight minutes yellowish green, very turbid; 10 c. c.; HCl. = 15; Ac. = 30.

9. After forty-one minutes yellowish green, very turbid; 20 c. c.; HCl. = 10; Ac. = 20.
10. After forty-seven minutes yellowish green, very turbid; 10 c. c.; HCl. = 10; Ac. = 20.
11. After sixty minutes yellowish green, very turbid; 10 c. c.; HCl. = 10; Ac. = 20.
12. After sixty-two minutes clear, dark brown; 2 c. c.; alk. = 20.

TEST II.

March 20, 1921. Magnesium sulphate, 13 per cent.

1. Fasting, canary yellow, turbid; 4 c. c.; alk. = 15.
2. After three minutes light yellow, greenish tinge, slightly turbid; 4 c. c.; alk. = 20; s. g. = 1030.
3. After seven minutes dark yellow, brownish tinge, slightly turbid; 40 c. c.; alk. = 25; s. g. = 1010.
4. After fifteen minutes brownish yellow, slightly turbid; 40 c. c.; alk. = 30; s. g. = 1010.
5. After eighteen minutes golden yellow, clear; 30 c. c.; alk. = 20; s. g. = 1005.

TEST III.

March 17, 1921. Magnesium citrate, 13 per cent.

1. Fasting, turbid, canary yellow; 8 c. c.; HCl. = 10; Ac. = 20.
2. Fasting, slightly turbid, light yellow; 5 c. c.; alk. = 10; s. g. = 1010.
3. After three minutes watery, clear; 10 c. c.; alk. = 10; s. g. = 1010.
4. After ten minutes light yellow, greyish, turbid; 10 c. c.; HCl. = 5; Ac. = 10.
5. After fifteen minutes light canary yellow, turbid; 10 c. c.; alk. = 20; s. g. = 1005.
6. After twenty minutes light yellow, slightly turbid; 40 c. c.; alk. = 20.
7. After forty-five minutes dark yellow, turbid; 10 c. c.; alk. = 20; s. g. = 1005.

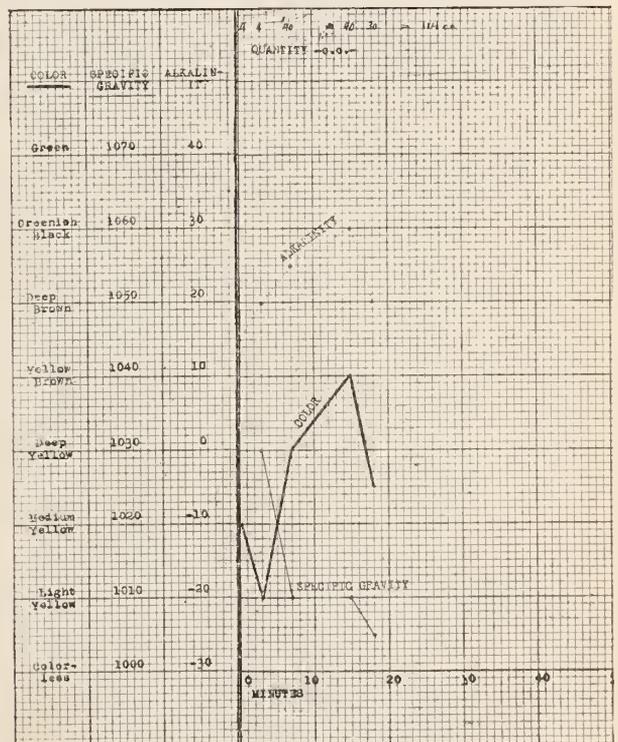


FIG. 2.—Mr. J. G. B. Magnesium sulphate thirteen per cent., March 20, 1921.

TEST IV.

March 9, 1921. Peptone, 5 per cent.

1. Fasting, canary yellow, turbid; 5 c. c.; alk. = 20; s. g. = 1010.
2. After four minutes greyish, turbid; 5 c. c.; alk. = 10; s. g. = 1010.

3. After seven minutes light yellow, slightly turbid; 3 c. c.; alk. = 25.
4. After eleven minutes dark brown yellow, clear; 5 c. c.; alk. = 25; s. g. = 1020.
5. After sixteen minutes light brown yellow, clear; 5 c. c.; alk. = 20.

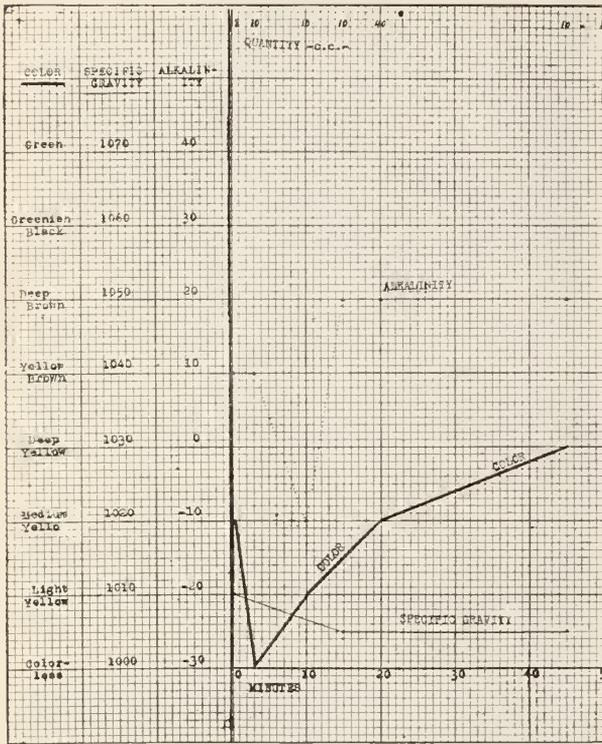


FIG. 3.—Mr. J. G. B. Magnesium citrate thirteen per cent., March 17, 1921.

6. After twenty-three minutes light brown, clear; 5 c. c.; alk. = 10.
7. After thirty minutes light yellow brown, clear; 5 c. c.; alk. = 10; s. g. = 1010.

TEST V.

March 12, 1921. Sodium bicarbonate, 8 per cent.

1. Fasting, canary yellow, turbid; 5 c. c.; alk. = 15.
2. After four minutes watery, clear; 5 c. c.; alk. = 25; s. g. = 1012.
3. After six minutes dark yellow brown, clear; 10 c. c.; alk. = 30; s. g. = 1020.
4. After nine minutes light yellow brown, clear; 5 c. c.; alk. = 20.
5. After twelve minutes dark yellow, turbid; 5 c. c.; alk. = 15; s. g. = 1010.

TEST VI.

March 10, 1921. Glucose, 25 per cent.

1. Fasting, canary yellow, slightly turbid; 5 c. c.; s. g. = 1010; alk. 20.
2. After two minutes clear, watery; 5 c. c.; s. g. = 1020.
3. After four minutes light yellow, clear; 10 c. c.; alk. = 20; s. g. = 1040; sugar = 1 per cent.
4. After six minutes dark brown yellow, clear; 10 c. c.; alk. = 25; s. g. = 1030.
5. After ten minutes light brown yellow, clear 5 c. c.; s. g. = 1030; alk. = 25.
6. After fifteen minutes darker brown yellow, clear; 5 c. c.; alk. = 30; s. g. = 1020.
7. After twenty minutes brownish yellow, greenish tinge, turbid; c. c.; alk. = 20; s. g. = 1010.
8. After thirty minutes light yellow, clear; 40 c. c.; alk. = 15.
9. After forty minutes light yellow, clear; 10 c. c.; alk. = 15; s. g. = 1010.

TEST VII.

March 11, 1921. Pilocarpine, 0.005 gm.

1. Canary yellow, turbid; 5 c. c.; s. g. = 1006; alk. = 10.
2. After ten minutes light yellow, clear; 10 c. c.; alk. = 10; s. g. = 1004.
3. After fifteen minutes canary yellow, turbid; 4 c. c.; alk. = 20; s. g. = 1004.
4. After twenty-five minutes light yellow, brownish, clear; 5 c. c.; alk. = 30; s. g. = 1005.
5. After twenty-five minutes dark brown yellow, clear; 10 c. c.; alk. = 30; s. g. = 1005.

TEST VIII.

March 14, 1921. Atropine sulphate, 0.0005 gm. in 60 c. c. of water.

1. Fasting, canary yellow, turbid, greenish tinge; 10 c. c.; alk. = 20; s. g. = 1015.
2. After four minutes, clear, watery; 5 c. c.; alk. = 20; s. g. = 1005.
3. After five minutes, canary yellow, turbid; 5 c. c.; alk. = 20.
4. After seven minutes light yellow brown, clear; 4 c. c.; alk. = 25.
5. After nine minutes dark yellow brown, clear; 5 c. c.; alk. = 35; s. g. = 1005.
6. After twenty minutes dark yellow brown, clear; alk. = 20; 5 c. c.
7. After thirty-eight minutes dark yellow, brownish tinge, clear; alk. = 20; 40 c. c.; s. g. = 1002.

TEST IX.

March 28, 1921. Mercurochrome, 0.5 per cent. in 60 c. c. of water.

1. Fasting, pea soup yellow, turbid; alk. = 20; s. g. = 1006; 10 c. c.
2. After three minutes very dark red, turbid; 5 c. c.; alk. = 15; s. g. = 1005.

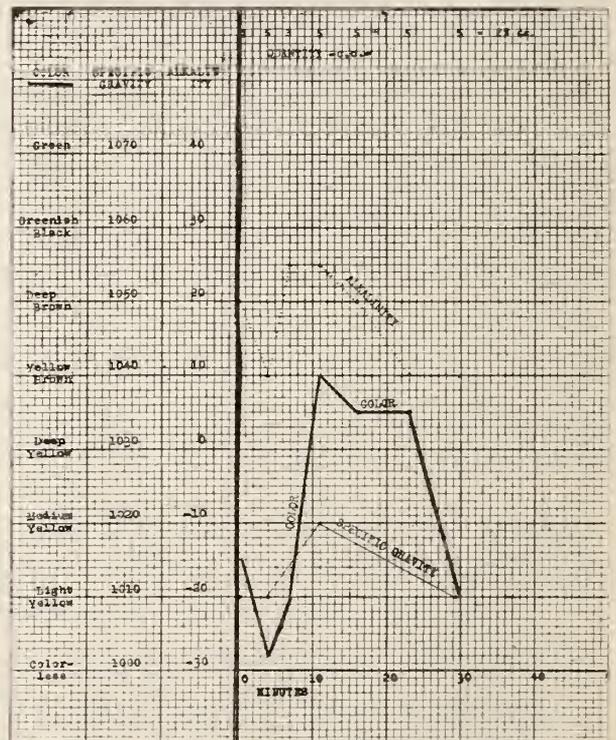


FIG. 4.—Mr. J. G. B. Peptone five per cent., March 9, 1921.

3. After seven minutes very dark red, yellow, turbid; 10 c. c.; s. g. = 1002; alk. = 20.
4. After fifteen minutes lighter red yellow, slightly turbid; 10 c. c.; alk. = 25; s. g. = 1002.
5. After twenty-five minutes light yellow, reddish, turbid; 10 c. c.; alk. = 35; s. g. = 1005.

6. After thirty minutes dark yellow, reddish, clear; 10 c. c.; alk. = 25; s. g. 1005.
7. After thirty-five minutes light yellow, reddish tinge, turbid; 10 c. c.; alk. = 30.
8. After fifty minutes light yellow, reddish tinge, turbid; 10 c. c.; alk. = 15; s. g. = 1010; (color altered by red of mercurochrome).

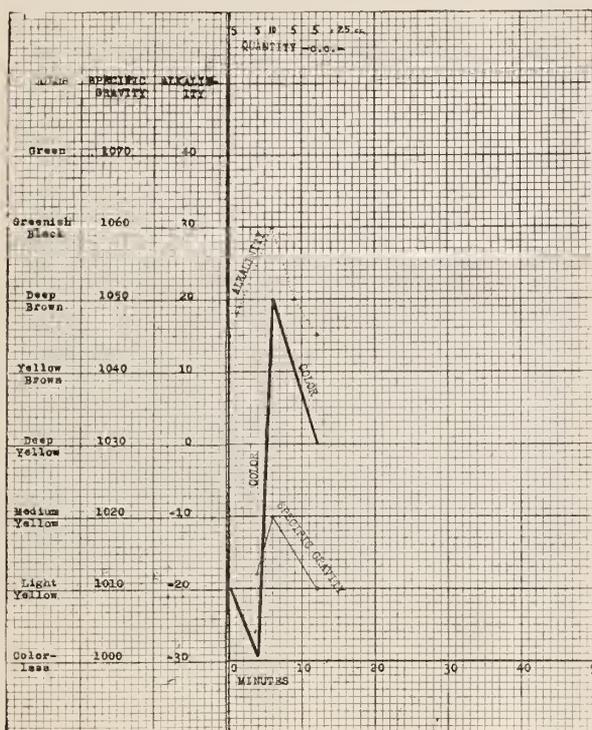


FIG. 5.—Mr. J. G. B. Sodium bicarbonate eight per cent., March 12, 1921.

TEST X.

March 11, 1921. Saline, 0.5 per cent.

1. Fasting, canary yellow, turbid; 5 c. c.; alk. = 20; s. g. = 1002.
2. After ten minutes watery, clear; 2 c. c.; alk. = 20.
3. After seventeen minutes light yellow, clear; 5 c. c.; alk. = 25; s. g. = 1010.
4. After thirty minutes light yellow, brownish, clear; 20 c. c.; alk. = 30; s. g. 1005.
5. After fifty minutes dark yellow, brown, clear; 40 c. c.; alk. = 20; s. g. = 1002

TEST XI.

March 19, 1921. Calomel, 0.06 gm. in 60 c. c. of water.

1. Fasting, canary yellow, greenish tinge, turbid; 15 c. c.; s. g. = 1010; alk. = 20.
2. After one minute watery, clear; 2 c. c.; alk. = 15; s. g. = 1010.
3. After nine minutes light yellow, turbid; 10 c. c.; alk. = 20; s. g. = 1012.
4. After eleven minutes dark yellow, clear; s. g. = 1020; alk. = 15; 40 c. c.
5. After twenty-nine minutes dark brown, yellow, clear; alk. = 15; s. g. = 1010; 15 c. c.

Fig. 1 (J. G. B.) shows the high specific gravity after twenty-five per cent. magnesium sulphate; the curve reaches 1040, when the salt partly returns with the light bile, then in the dark bile it is 1020, in order to go down with the lighter bile to 1010.

Fig. 2 (J. G. B.) gives the same items with the thirteen per cent. magnesium sulphate. The specific gravity in the light bile (from the admixture of the salt) gives a specific gravity of 1030, in the

dark bile 1010, and goes down in the lighter bile to 1006.

Comparing Figs. 1 and 2 one sees the influence of the greater concentration of magnesium sulphate on the height of the color reaction (reaching up to deep brown when twenty-five per cent. and yellow brown when thirteen per cent. was given) and the specific gravity, which is correspondingly lower, with the smaller concentration.

Fig. 3 (J. G. B.) shows the action of thirteen per cent. magnesium citrate which gives a very faint color reaction, in fact less than any of the other substances tried.

Fig. 4 (J. G. B.), five per cent. peptone, shows a good color reaction, with the specific gravity fluctuating between 1010 and 1020.

Fig. 5 (J. G. B.) shows a pronounced color reaction after eight per cent. bicarbonate of soda, with the specific gravity fluctuating between 1010 and 1020.

Fig. 6 (J. G. B.) shows an intense color reaction after the twenty-five per cent. glucose, with a specific gravity between 1010-1040.

Fig. 7, pilocarpine 0.005 gm.; Fig. 8, atropine 0.0005 gm.; Fig. 10, sodium chloride one half per cent., and Fig. 11, calomel 0.06 gm., all give good color reactions, with low specific gravities varying from 1006-1010. Fig. 9, mercurochrome, gives, likewise, a low specific gravity while the color reaction, although present, could not be illustrated on account of the admixture of the original red color.

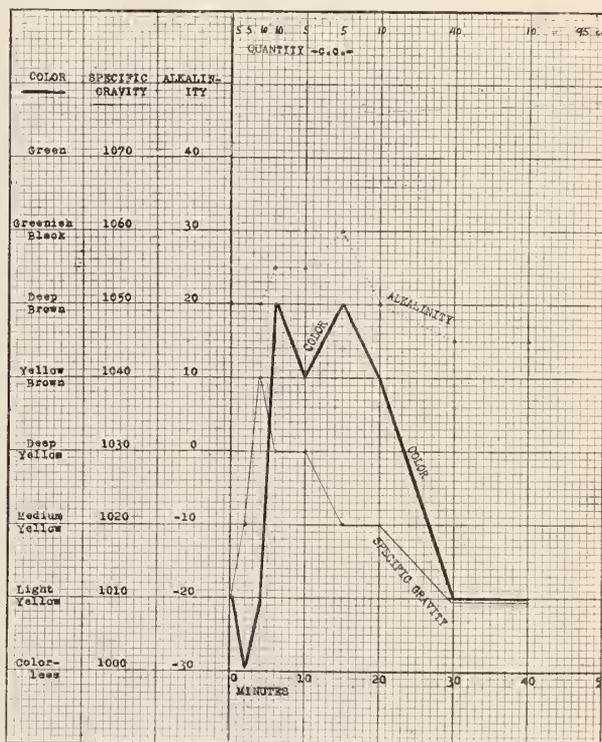


FIG. 6.—Mr. J. G. B. Glucose twenty-five per cent., March 10, 1921.

With regard to the quantity of bile excreted and in what time (or length of cycle) after the different ingredients, we find the following relations in the graphs of J. G. B.:

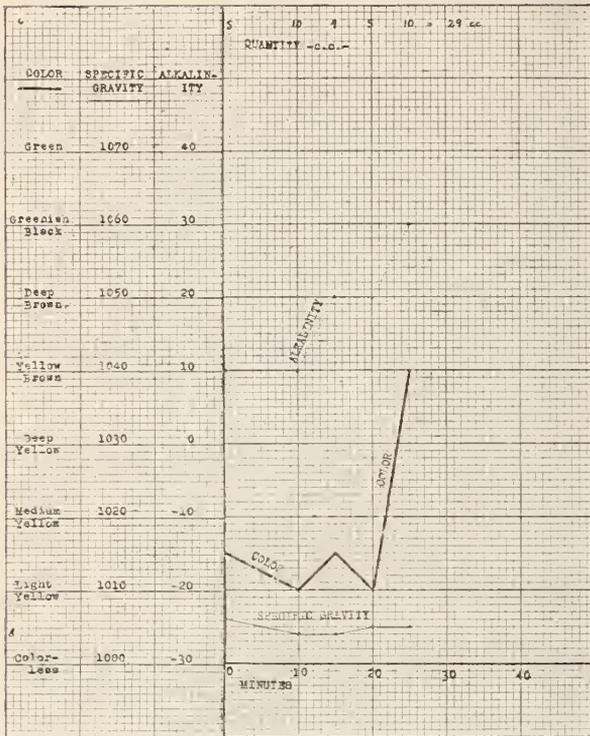


FIG. 7.—Mr. J. G. B. Pilocarpine 0.005 gram in sixty c.c. water, March 11, 1921.

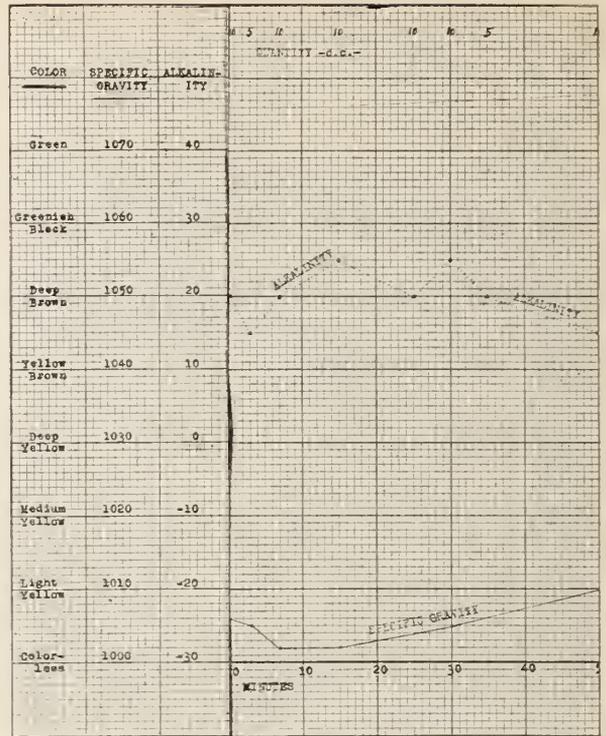


FIG. 9.—Mr. J. G. B. Mercurochrome one half per cent., March 21, 1921. (Color altered by presence of mercurochrome.)

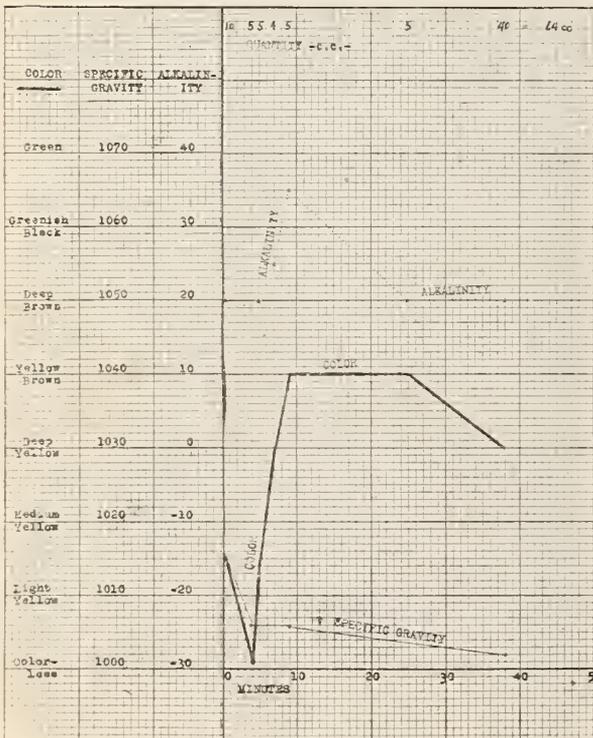


FIG. 8.—Mr. J. G. B. Atropine 0.0005 gram in sixty c.c. water, March 14, 1921.

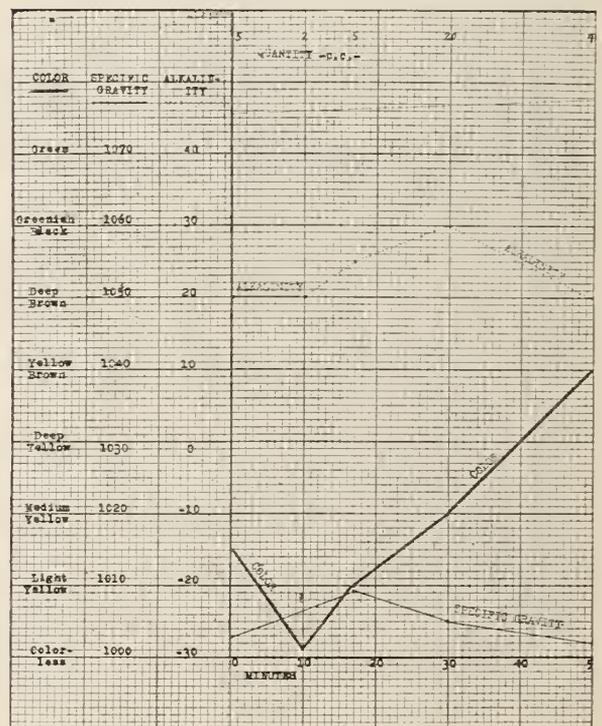


FIG. 10.—Mr. J. G. B. Sodium chloride one half per cent., March 11, 1921.

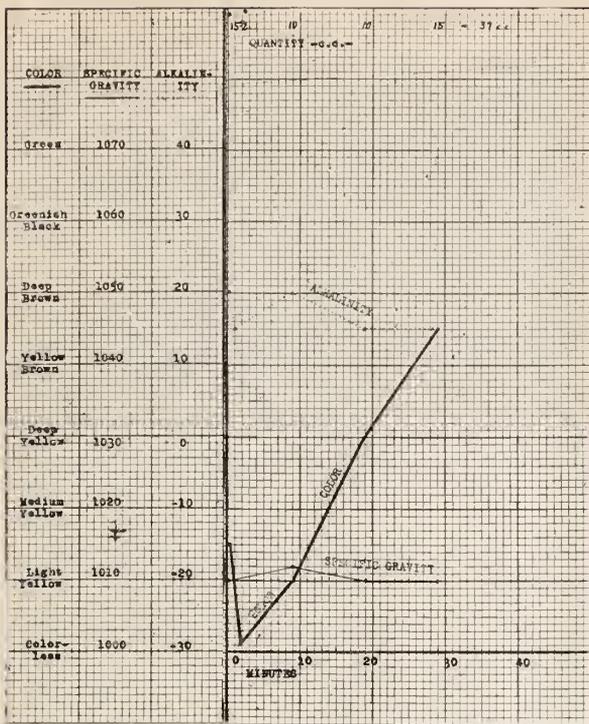


FIG. 11.—Mr. J. G. B. Calomel 0.06 gram in sixty c.c. water, March 19, 1921.

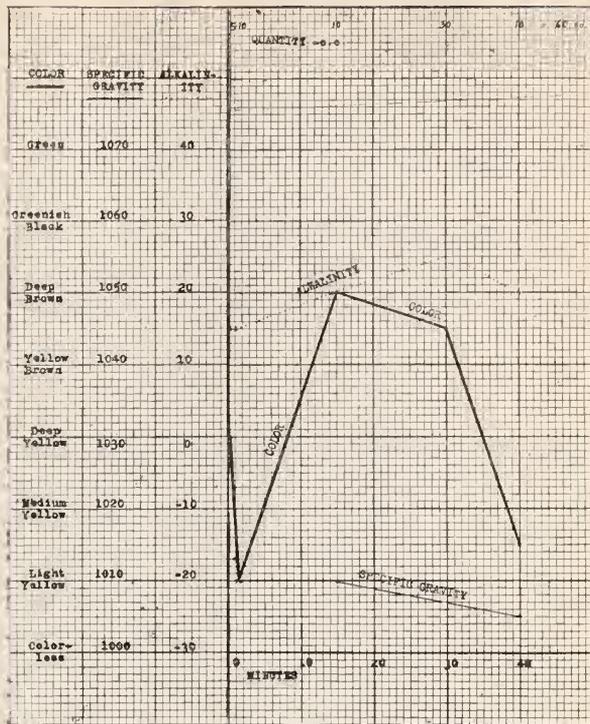


FIG. 13.—Mrs. Bella G. Cholecystectomy, peptone five per cent., March 25, 1921.

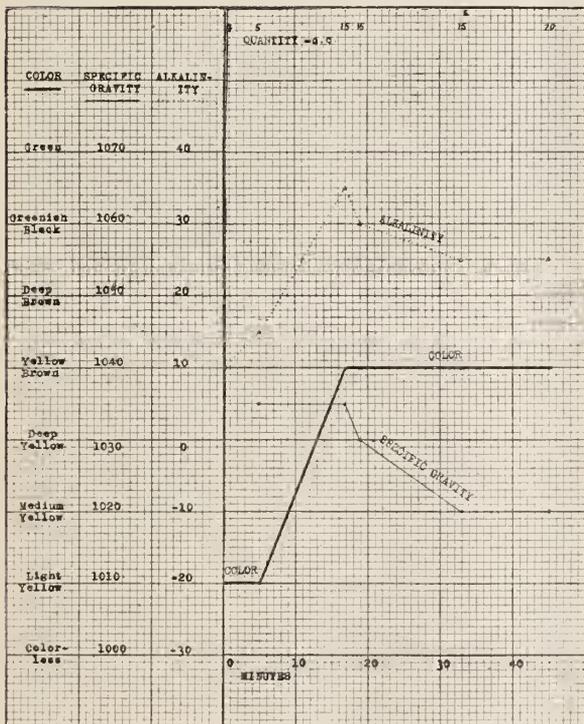


FIG. 12.—Mrs. Bella G. Cholecystectomy, magnesium sulphate twenty-five per cent., March 20, 1921.

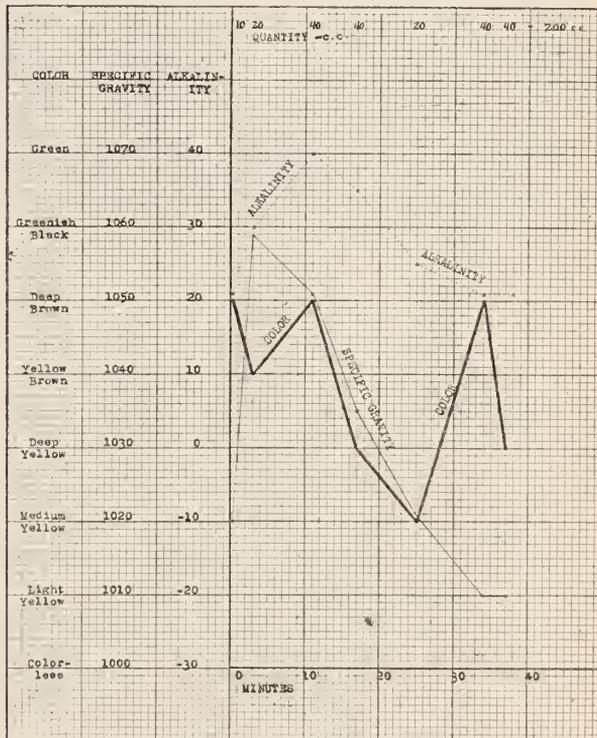


FIG. 14.—Miss Marie L. Cholecystectomy, magnesium sulphate twenty-five per cent., March 16, 1921.

Magnesium sulphate, 25 per cent.....	86 c.c.	60 min.
Magnesium sulphate, 13 per cent....	114 c.c.	18 min.
Magnesium citrate, 13 per cent.....	80 c.c.	46 min.
Peptone, 5 per cent.....	28 c.c.	30 min.

4. After thirty-five minutes light yellow, turbid; alk. = 15; s. g. = 1015; 40 c. c.

TEST III.

March 16, 1921. Sodium sulphate, 25 per cent.

1. Fasting, dark yellow, greenish tinge; 5 c. c; s. g. = 1010; alk. = 20.
2. After eight minutes greyish yellow, turbid; 15 c. c.; alk. = 25; s. g. = 1025.
3. After twenty minutes dark yellow, slightly turbid; 10 c. c.; alk. = 20; s. g. = 1020.
4. After thirty-five minutes very dark brown, yellow, turbid; 10 c. c.; alk. = 20; s. g. = 1010.

TEST IV.

March 19, 1921. Calomel, 0.06.

1. Fasting, dark yellow, turbid; alk.; 1 c. c.
2. After five minutes, watery, clear; alk. = 20; 2 c. c.
3. After ten minutes light yellow, turbid; alk. = 20; 4 c. c.
4. After twenty minutes dark yellow, greenish tinge, turbid; alk. = 25; 40 c. c.
5. After thirty minutes light yellow, turbid; alk. = 20; 5 c. c.

TEST V.

March 21, 1921. Mercurochrome, 0.5 per cent.

1. Fasting, light yellow, greenish tinge, turbid; 2 c. c.; alk. = 15.
2. After ten minutes dark red, clear; alk. = 15; 5 c. c.
3. After twenty minutes light red, turbid; alk. = 15; 5 c. c.
4. After thirty minutes canary yellow, turbid; alk. = 20; 10 c. c.; s. g. = 1010.
5. After thirty-five minutes dark green, yellow, turbid; 40 c. c.; alk. = 30; s. g. = 1010.
6. After fifty minutes pale red, turbid; alk. = 10; 5 c. c.

CASE III.—Isaac A., with gastric ulcer and chronic cholecystitis. The following ingredients were given alternately:

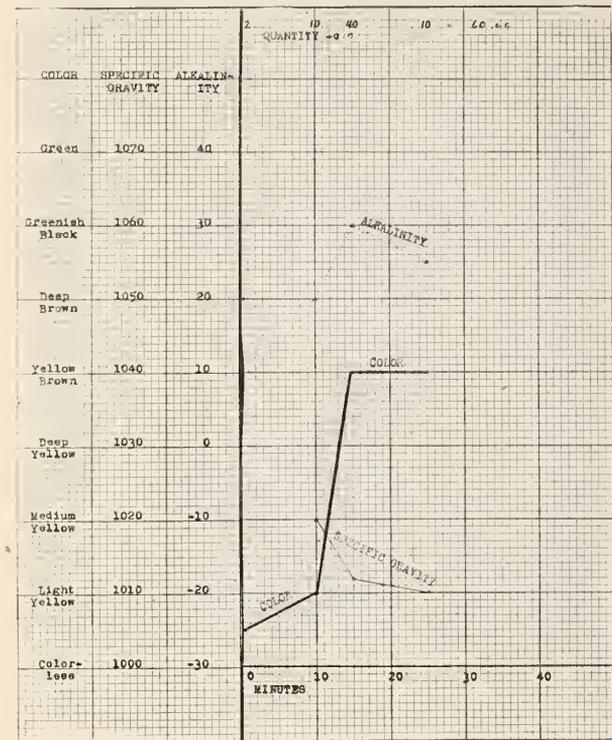


FIG. 15.—Miss Marie L. Cholecystectomy, peptone five per cent., March 25, 1921.

Sod. bicarbonate, 8 per cent.....	25 c.c.	12 min.
Glucose, 25 per cent.....	95 c.c.	40 min.
Pilocarpine, 0.005	29 c.c.	25 min.
Atropine, 0.0005	64 c.c.	38 min.
Mercurochrome, 1/2 per cent.....	60 c.c.	50 min.
Sodium chloride, 1/2 per cent.....	67 c.c.	50 min.
Calomel, 0.06	37 c.c.	29 min.

The largest amount of bile furnished was after thirteen per cent. magnesium sulphate, namely, 114 c. c. in eighteen minutes; the next highest is after glucose twenty-five per cent., ninety-five c. c. in forty minutes.

CASE II.—F. J. R., with probable cholecystitis. The following ingredients were tested:

TEST I.

March 14, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, canary yellow, greenish tinge, turbid; 5 c. c.; alk. = 20; s. g. = 1010; (cholesterin crystals, pus cells, and mucus).
2. After one minute watery, clear; alk. = 20; s. g. = 1010; 5 c. c.
3. After three minutes light golden yellow, clear; alk. = 25; s. g. = 1020.
4. After twenty minutes very dark brown, greenish, yellow, turbid; alk. = 35; s. g. = 1030.
5. After thirty minutes shade lighter brown, greenish yellow; alk. = 30; s. g. = 1020.
6. After forty minutes shade lighter brown, greenish yellow; alk. = 30; s. g. = 1010.

TEST II.

March 20, 1921. Magnesium sulphate, 13 per cent.

1. Fasting, light canary yellow, turbid; alk. = 20; 4 c. c.
2. After ten minutes light yellow, clear, greenish tinge; s. g. = 1025; 10 c. c.; alk. = 20.
3. After twenty-five minutes turbid, very dark yellow; alk. = 30; s. g. = 1020; 20 c. c.

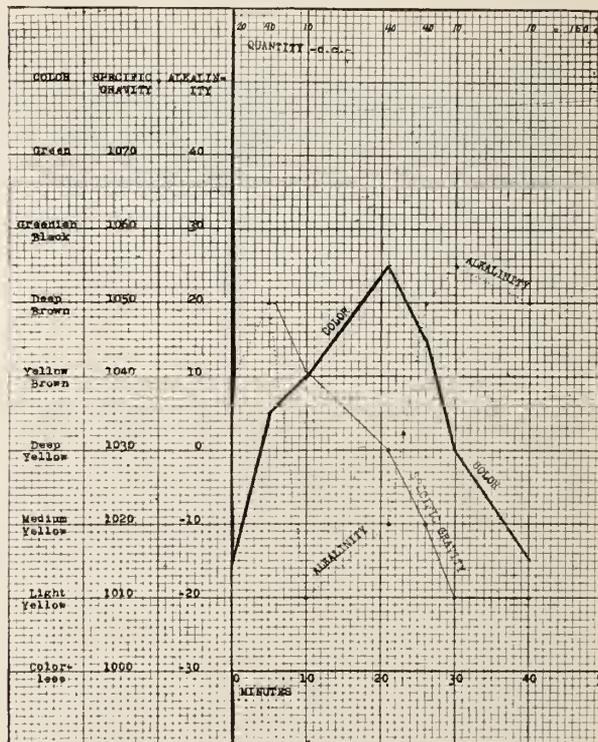


FIG. 16.—Mr. H. B. Before cholecystectomy, magnesium sulphate twenty-five per cent., March 20, 1921.

TEST I.

March 3, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, light golden yellow, clear; alk. = 20; s. g. = 1010; 10 c. c.

2. After fifteen minutes golden yellow, clear; alk. = 25; s. g. = 1030; 10 c. c.
3. After twenty-five minutes dark yellow, slightly turbid; 5 c. c.; alk. = 25; s. g. = 1020.

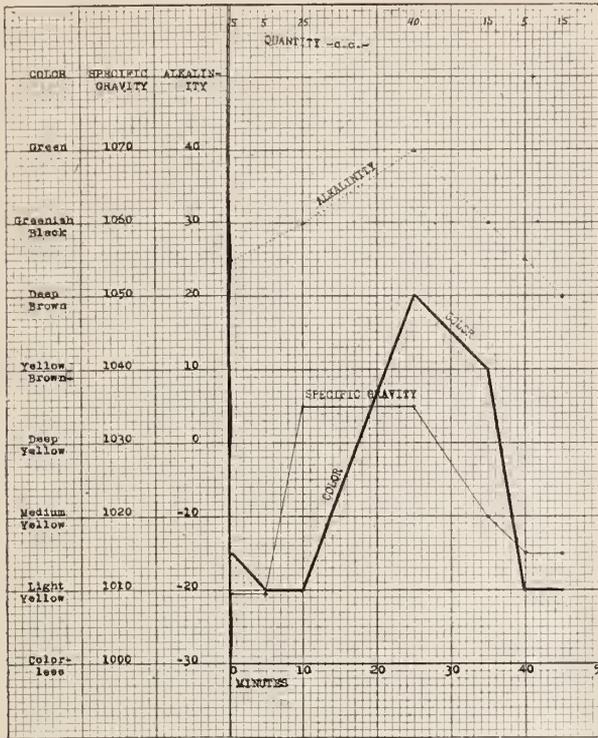


FIG. 17.—Mr. J. G. R. Magnesium sulphate twenty-five per cent., March 23, 1921.

4. After thirty-five minutes golden yellow, clear; alk. = 20; 10 c. c.
5. After forty-five minutes dark yellow, clear; alk. = 20; s. g. 1010; 5 c. c.

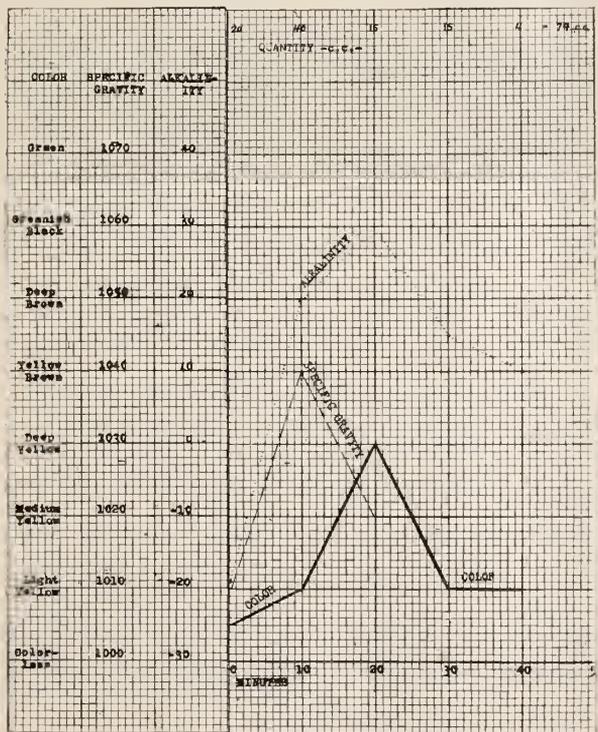


FIG. 18.—Mr. J. G. R. Sodium bicarbonate eight per cent., March 28, 1921.

TEST II.

March 5, 1921. Peptone, 5 per cent.

1. Fasting, dark yellow, turbid; alk. = 20; 10 c. c.
2. After fifteen minutes dark yellow, greenish tinge, turbid; alk. = 25; 8 c. c.
3. After twenty minutes dark yellow, greenish tinge; alk. = 25; 6 c. c.
4. After thirty minutes canary yellow, turbid; alk. = 20; 5 c. c.
5. After thirty-five minutes canary yellow; 5 c. c.; alk. = 20.

TEST III.

March 8, 1921. Magnesium citrate, 13 per cent.

1. Fasting, canary yellow, very turbid; 10 c. c.; HCl = 10; Ac. = 20.
2. After twenty minutes canary yellow, turbid; 10 c. c.; HCl = 10; Ac. = 20.
3. After thirty minutes light yellow, clear; alk. = 20; 10 c. c.
4. After forty minutes light yellow, clear; alk. = 20; 10 c. c.

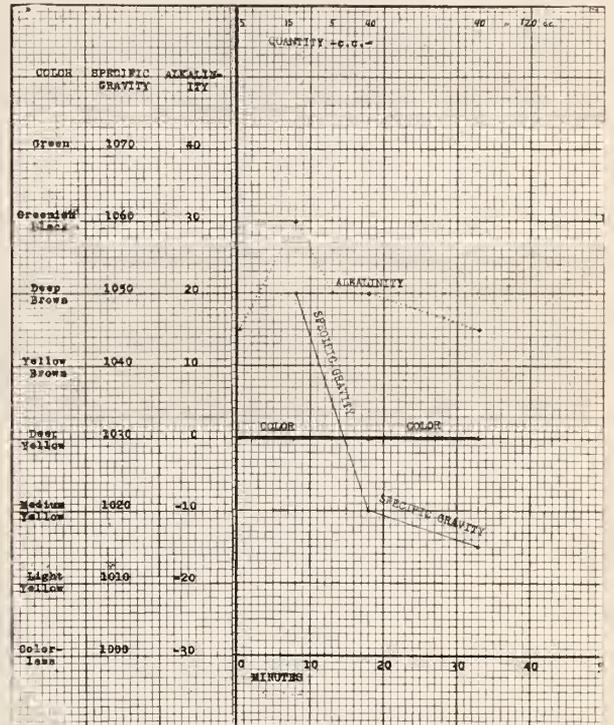


FIG. 19.—Mr. Henry S. Tumor of liver, magnesium sulphate twenty-five per cent., January 21, 1921.

TEST IV.

March 5, 1921. Sodium bicarbonate, 8 per cent.

1. Fasting, dark yellow, turbid; alk. = 20; 4 c. c.
2. After thirty minutes dark yellow, greenish tinge, clear; s. g. = 1030; 15 c. c.; alk. = 40.
3. After sixty minutes golden yellow, slightly turbid; s. g. = 1020; alk. 25; 10 c. c.
4. After one and one half hours golden yellow, turbid; s. g. = 1020; 15 c. c.; alk. = 20.
5. After two hours light yellow, slightly turbid; s. g. = 1010; alk. = 20; 4 c. c.

TEST V.

March 1, 1921. Saline, 3 per cent.

1. Fasting, light canary yellow, turbid; 10 c. c.; HCl. = 5; Ac. = 10.
2. After five minutes very light yellow, turbid; HCl. = 5; Ac. = 10; 10 c. c.
3. After ten minutes dark yellowish, brownish tinge; alk. = 25.
4. After twelve minutes very dark brown yellow, greenish tinge, clear; alk. = 25.
5. After fifteen minutes shade darker, brownish yellow, clear; alk. = 25.

TEST VI.

March 11, 1921. Saline, 0.5 per cent.

1. Fasting, yellow, slightly turbid; s. g. = 1006; alk. = 20; 5 c. c.
2. After twenty minutes light yellow, slightly turbid; alk. = 20; s. g. = 1010; 5 c. c.
3. After twenty-five minutes canary yellow, turbid; HCl. = 10; Ac. = 20; s. g. = 1012; 10 c. c.
4. After thirty minutes light golden yellow, clear; alk. = 25; s. g. = 1010; 8 c. c.
5. After forty minutes canary yellow, turbid; alk. = 20; s. g. = 1006; 8 c. c.

CASE IV.—Mrs. J. L. B., patient with duodenal ulcer and probable cholecystitis. The following ingredients were tested:

TEST I.

March 10, 1921. Glucose, 25 per cent.

1. Fasting, light canary yellow, turbid; alk. = 15; s. g. = 1020.
2. After ten minutes watery, clear; alk. = 15.
3. After twenty minutes light canary yellow, slightly turbid; alk. = 20; s. g. = 1040.
4. After thirty minutes very light yellow, clear; alk. = 20; s. g. = 1030.

TEST II.

March 11, 1921. Saline, 0.5 per cent.

1. Fasting, brownish yellow, slightly turbid; s. g. = 1005; alk. = 20; 5 c. c.
2. After ten minutes watery, slightly turbid; s. g. = 1004; alk. = 20; 4 c. c.
3. After twenty minutes light brownish yellow, clear; alk. = 25; 10 c. c.
4. After forty-five minutes brownish yellow, clear; s. g. = 1002; 40 c. c.

TEST III.

March 15, 1921. Pilocarpin, 0.005 gm. in 60 c. c.

1. Fasting, canary yellow, turbid; s. g. = 1010; 5 c. c.
2. After one minute clear, watery; s. g. = 1002; 2 c. c.
3. After thirty minutes canary yellow; turbid; s. g. = 1002; 5 c. c.
4. After forty-five minutes dark yellow, brownish tinge; turbid; s. g. = 1000; 10 c. c. (patient vomited).

TEST IV.

March 14, 1921. Atropine sulphate, 0.0005 gm. in 60 c. c. of water.

1. Fasting, canary yellow, turbid; alk. = 15; s. g. = 1010; 5 c. c.
2. After four minutes light canary yellow, clear; alk. = 15; 5 c. c.
3. After ten minutes dark yellow, brownish tinge, clear; alk. = 15; s. g. = 1010; 5 c. c.
4. After fifteen minutes light yellow, brownish tinge, clear; alk. = 20; 10 c. c.
5. After twenty minutes light yellow brownish tinge, clear; 10 c. c. alk. = 20; s. g. = 1005.

CASE V.—Fabian B., patient with achylia gastrica and cholecystitis. The following substances were given:

TEST I.

March 25, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, light yellow, turbid; alk. = 20; 4 c. c. A. = 10; S. = 1; T. = 0.
2. After eight minutes light straw yellow, clear; s. g. = 1030; 5 c. c.
3. After twenty minutes dark yellow, turbid; s. g. = 1030; 5 c. c.
4. After fifty minutes very dark brownish green, turbid; s. g. = 1025; 40 c. c.
5. After fifty-five minutes light yellow brown, clear; s. g. = 1020; 5 c. c.
6. After sixty minutes light yellow brown, clear; s. g. = 1020; 3 c. c.
7. After sixty-five minutes light yellow, turbid; s. g. = 1015; 5 c. c.

TEST II.

March 12, 1921. Peptone, 5 per cent.

1. Fasting, greyish; no bile; alk. = 10; s. g. = 1010; 15 c. c.
2. After two minutes greyish, no bile; alk. = 15; 10 c. c.
3. After four minutes dark yellow, turbid; alk. = 15; 5 c. c.
4. After thirteen minutes very dark yellow, turbid; 15 c. c.; alk. = 20; s. g. = 1012.
5. After fourteen minutes dark yellow, turbid; alk. = 20; 4 c. c.
6. After twenty-eight minutes lighter dark yellow, turbid; alk. = 20; 3 c. c.
7. After fifty minutes very dark yellow, turbid; alk. = 20; s. g. = 1010; 40 c. c.
8. After fifty-five minutes lighter dark yellow, turbid; 5 c. c.; alk. = 10.
9. After fifty-seven minutes lighter yellow; 5 c. c.; alk. = 15.

TEST III.

March 19, 1921. Glucose, 20 per cent.

1. Fasting, greyish turbid; alk. = 10; 2 c. c.
2. After seventeen minutes watery, clear; s. g. = 1040; alk. = 10; 50 c. c.
3. After forty minutes dark yellow, turbid; s. g. = 1020; alk. = 20; 20 c. c.
4. After fifty minutes shade lighter yellow, turbid; alk. = 25; 15 c. c.
5. After fifty-six minutes greyish, turbid; alk. = 10; 10 c. c.

A number of other patients were given the different salts mentioned and also various medicaments. The present article would become too cumbersome should they all be described. Suffice it to say that similar reactions although in various gradations, were obtained in most patients from all the ingredients tested. The specific gravity of the dark bile was increased, when the substance given had a high specific gravity (magnesium sulphate, glucose) and not increased when the substances ingested did not influence it, like peptone, calomel, atropine, pilocarpine, etc.

Four new cases, patients with cholecystectomies, Mrs. B. G., Miss M. L., Mrs. C. S., and Mrs. Y. S., gave a good reaction with magnesium sulphate and also with a five per cent. peptone solution. Studies of two of these cases, Mrs. B. G. and Miss M. L., are illustrated in graphs (Figs. 12 to 15). Here also as in patients with the presence of a gallbladder the specific gravity of the dark bile after magnesium sulphate is much higher than in the dark specimen obtained after the peptone instillation. In fact all the substances producing reaction (dark bile) do it whether the gallbladder is present or not. It is evident that the gallbladder as such has nothing whatever to do with this phenomenon.

Dr. Willy Meyer and I were able to furnish another positive proof that the dark bile need not come from the gallbladder, but can be eliminated from the liver directly. The following instance demonstrated this very clearly:

Patient H. B., with cholecystitis, was given magnesium sulphate on the day previous to operation. He gave a characteristic dark color bile reaction as the following notes from our notebook demonstrated and as the subjoined graph (Fig. 16) shows:

CASE VI.—Mr. H. B., with chronic cholecystitis.

TEST I.

March 21, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, pea soup appearance, yellow, turbid; alk. = 10; 20 c. c.

2. After five minutes dark yellow brown, greenish tinge, turbid; 40 c. c.; alk. = 20; s. g. = 1050.

3. After ten minutes brownish yellow, turbid; 10 c. c.; HCl = 10; Ac. = 20; s. g. = 1040.

4. After twenty-one minutes dark brown yellow, greenish tinge; 40 c. c.; s. g. = 1030; HCl = 5; Ac. = 10.

5. After twenty-six minutes yellowish green on upper three-quarter; dark brown yellow on lower one-quarter; 40 c. c.; s. g. = 1020; alk. = 20.

6. After thirty minutes greenish yellow, turbid; 10 c. c.; alk. = 25; s. g. = 1010.

7. After forty minutes light yellow, brown, turbid; alk. = 20; s. g. = 1010; 10 c. c.

TEST II.

March 23, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, light yellow, very turbid; alk. = 20.

2. After eleven minutes light yellow, greenish tinge, turbid; alk. = 35; s. g. = 1016.

3. After thirty minutes light greenish yellow, slightly turbid; s. g. = 1060; alk. = 30.

At the operation (the duodenal tube had been left *in situ*) two important points were ascertained: 1, magnesium sulphate was given through the tube; after waiting from five to ten minutes no dark bile was obtained. The gallbladder which was exposed and constantly observed did not show any contractions; 2, at the operation the cystic duct was found tightly closed by a stone so that nothing could leave or enter the gallbladder. Moreover, after opening the latter, the contents were found to have a reddish appearance and consisting of pus and red blood corpuscles mixed with mucus, without any bile.

Inasmuch as there has been no bile in the gallbladder and this condition must have existed for quite some time and inasmuch as nothing could enter or leave the vesicular cavity, the dark bile obtained the day previous could not have originated from this source and must of necessity have come from the liver ducts (choledochus).

In a few rare instances the color reaction of the bile after magnesium sulphate appears quite abruptly, lasts a little while and suddenly ceases. In these cases it would be natural to assume that the dark colored bile came from the gallbladder as a result of the relaxing action of the magnesium salt. This, however, does not seem to be the case, for in these patients other salts, especially bicarbonate of soda, or other liver irritants will do the same, showing that this phenomenon is not due to an evacuation of the gallbladder contents. As an illustration two graphs are given (Figs. 17 and 18).

CASE VII.—John G. R., patient with duodenal ulcer and chronic cholecystitis.

TEST I.

March 23, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, watery, canary yellow, turbid; 5 c. c.; s. g. = 1010; alk. = 15.

2. After five minutes yellow, watery; s. g. = 1010; 5 c. c.

3. After ten minutes light yellow, greenish tinge, turbid; alk. = 30; s. g. = 1035; 15 c. c.

4. After twenty-five minutes very dark brown, turbid; alk. = 40; s. g. = 1035; 40 c. c.

5. After thirty-five minutes light brown, turbid; alk. = 30; s. g. = 1020; 15 c. c.

6. After forty minutes very light yellow, brownish tinge, slightly turbid; alk. = 25; s. g. = 1015; 5 c. c.

7. After forty-five minutes light yellow, slightly turbid; alk. = 20; s. g. = 1015; 15 c. c.

TEST II.

March 28, 1921. Bicarbonate of soda, 8 per cent.

1. Fasting, very light yellow, turbid; 20 c. c.; HCl. = 10; Ac. = 20.

2. After ten minutes light yellow, clear; s. g. = 1040; alk. = 20; 40 c. c.

3. After twenty minutes dark yellow, slightly turbid; alk. = 30; s. g. = 1020; 15 c. c.

4. After thirty minutes light yellow, clear; alk. = 15; s. g. = 1020; 15 c. c.

5. After forty minutes light yellow, clear; alk. = 10; 4 c. c.

The difference in the specific gravity of the dark bile after magnesium sulphate and that after the bicarbonate of soda clearly indicates that this process is not due to a mere release of concentrated bile from the bladder, but rather to a chemical action on the liver. Thus the higher concentration of the magnesium salt (twenty-five per cent.) caused an elimination of a bile of a higher specific gravity than bicarbonate of soda (eight to nine per cent.).

From my experiences with different salts and other chemical ingredients when injected into the duodenum, it is apparent that the liver can be induced to a greater activity to an elimination of a darker, more concentrated bile.

As mentioned in my former paper on this subject, injections of these substances into the duodenum can be conveniently used as a functional test of the activity of the liver. Magnesium sulphate, sodium sulphate, peptone, glucose solutions, also bicarbonate of soda, appear to be appropriate for this purpose.

We give here three new cases of severe liver lesions in which this color reaction of the bile after the injection of these liver stimulants into the duodenum did not show up. One of these cases is given in Fig. 19. The others are briefly described.

CASE VIII.—S., patient with cancer of the liver.

TEST I.

January 21, 1921. Magnesium sulphate, 25 per cent.

1. Fasting, dark yellow, turbid; 5 c. c.; alk. = 15.

2. After eight minutes dark yellow, clear; alk. = 30; s. g. = 1050; 15 c. c.

3. After thirteen minutes dark yellow, turbid; alk. = 20; 5 c. c.

4. After eighteen minutes dark yellow, turbid; alk. = 20; s. g. = 1020; 40 c. c.

5. After thirty-three minutes very dark yellow, turbid; s. g. = 1015; alk. = 15; 40 c. c.

CASE IX.—Mrs. A. A.; January 18, 1921; patient with subnutrition and chronic cholecystitis.

TEST I.

Magnesium sulphate, 25 per cent.

1. Fasting, dark yellow, turbid; alk. = 15; 5 c. c.

2. After five minutes light yellow, clear; alk. = 15; 5 c. c.

3. After eleven minutes light yellow, slightly turbid; alk. = 20; 5 c. c.

4. After twenty-one minutes dark yellow, turbid; alk. = 20; s. g. = 1030; 15 c. c.

5. After forty-three minutes shade lighter yellow, turbid; alk. = 20; 10 c. c.

6. After fifty-two minutes dark yellow, clear; alk. = 20; 4 c. c.

TEST II.

Mrs. A. January 15, 1921. Sodium sulphate, 25 per cent.

1. Fasting, dark yellow, greenish tinge; alk. = 16; 10 c. c.

2. After three minutes light golden yellow, turbid; alk. = 15; 5 c. c.

3. After eleven minutes light golden yellow, turbid; alk. = 20; 10 c. c.

4. After seventeen minutes light golden yellow, turbid; alk. = 15; 10 c. c.

5. After twenty-two minutes yellow, turbid; HCl. = 5; Ac. = 10; 5 c. c.

6. After twenty-eight minutes light golden yellow, turbid; alk. = 10; 5 c. c.

7. After thirty-five minutes dark yellow, slightly turbid; alk. = 15; 5 c. c.

TEST III.

January 22, 1921. Glucose, 20 per cent.

1. Fasting, light yellow, turbid; alk. = 15; 3 c. c.

2. After five minutes light yellow, turbid; alk. = 20; 5 c. c.; s. g. = 1060.

3. After ten minutes light yellow, turbid; s. g. = 1045; alk. = 20; 10 c. c.

4. After twenty minutes light yellow, clear; s. g. = 1030; alk. = 15; 5 c. c.

CASE X.—Mrs. Anna R., with cholecystitis and cirrhosis of the liver (with jaundice); March 21, 1921. Twenty-five per cent. magnesium sulphate.

TEST I.

1. Fasting, greyish, tinge of yellow, turbid; alk. = 10; 2 c. c.

2. After eight minutes light yellow, clear; alk. = 10; 5 c. c.

3. After ten minutes light greenish yellow, slightly turbid; alk. = 20; s. g. = 1025; 40 c. c.

4. After forty minutes yellowish, greenish tinge, turbid; alk. = 20; s. g. = 1020; 40 c. c.

TEST II.

March 28, 1921. Sodium bicarbonate, 8 per cent.

1. Fasting, light green yellow, clear; alk. = 10; 10 c. c.

2. After ten minutes light green yellow, clear; alk. = 20; 20 c. c.

3. After fifteen minutes dark green yellow, clear; alk. = 20; 30 c. c.

Lyon had suggested the employment of the magnesium sulphate instillation as a means of diagnosis in gallbladder lesions and also for the differentiation of the different biles (from gallbladder, common duct, and hepatic duct).

As shown before and again in this paper Lyon's assumption of the different sources of bile, as judged by the color, does not seem to be correct.

The question arises what are the best conditions for the examination of the bile in gallbladder lesions.

Inasmuch as the magnesium sulphate and other liver stimulants increase the flow of bile from the liver and drive it, so to say, quickly and directly into the duodenum, there will be after these substances a bile product from the liver direct containing very little if any bile from the gallbladder. In the fasting condition and without any previous stimulation the aspiration succeeds in obtaining what little bile there is in the duodenum from the liver and the gall bladder, or there seems to be more chance for the appearance of some gallbladder bile when the flow of liver bile is not extensive.

In practising bile examinations in the fasting state of the patient, for the last ten years or so, I found this to be the case.

Diagnostically, then, we can find many more valuable hints regarding gallbladder lesions from the examination of the natural fasting bile than from the bile obtained after the stimulation by magnesium sulphate.

In cases of jaundice, however, in which no bile is found in the fasting state, a liver stimulant may be injected into the duodenum, in order to ascertain whether the increased flow of bile from the liver is still able to push through some of its products into the duodenum. In fact, in a number of such cases of chronic jaundice with no bile in the duodenum while fasting, the magnesium sulphate caused the appearance of some bile after a short time, thus showing that the common duct occlusion was not complete. In these cases the magnesium sulphate or peptone or glucose test is of diagnostic aid.

Before I conclude this paper I wish to thank Dr. Willy Meyer and Dr. Terek for permission to examine their cases and Dr. H. Bockus, Dr. H. Puhlman and Dr. H. A. Rafsky for assisting in carrying out the investigations.

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Clinical Gastric Analysis with Detail of Method and a Consideration of the Maximum Information to Be Obtained*

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We have not endeavored to present anything particularly new in this study, but it is rather our purpose to present in detail a practical, clinical method of performing a fractional gastric analysis and also to reemphasize the statements of other writers that the estimation of the acid values is the least important of the many points that can be learned from such an examination when intelligently conducted. We wish particularly to stress a few points which to us seem important, and to amplify

certain microscopic observations which are helpful in arriving at a diagnosis. The method to be outlined we have found practical for both dispensary and private practice, and the information obtained has amply repaid us for the large amount of time consumed in securing detailed facts.

No two fractional charts can be compared unless they have both been done under identical conditions and the same points noted for each, and the obvious advantages of a standard technic are seen when an attempt is being made to analyze the deviations from normal in any given chart. This is even of

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greater importance when two charts from the same patient are being analyzed. We also wish to emphasize the need of investigation into the associated findings of the stomach, other than the acid values. These include the presence of mucus and bile, and the addition of pathological products, such as bacteria, pus, blood and tissue juices. These associated findings all have a direct influence on the interpretation of the acid curves and also yield much information as to the intragastric and extragastric pathology.

We will not enter here into a discussion of the relative merits of fractional analysis versus the single extraction method, other than to say that we agree with Best (1), who says: "The advantage of these curves in their superiority over the older one sample test is comparable to the advantage of the moving picture over a single snapshot."

It has only been since 1914 that fractional gastric analysis has been in general use. At that time Rehfuess (2) revived the fractional method and gave it a fresh impetus by using the small sized tube with metal tip. In this and subsequent papers this investigator laid down certain fundamental principles of fractional analysis to which subsequent writers have been able to add little of vital importance. So-called normals, as well as abnormals, were studied by Rehfuess and Hawk, Best, Rutz, and others to determine a normal curve and institute a standard. But since the type of normal curve could not be stabilized, other investigations took place involving the enzyme action of gastric and duodenal juices, together with microscopic observations of fasting and digesting stomach contents.

The fractional analysis method is simple, safe and extremely sane, and is a method not only of choice but one of necessity where gastric function is to be studied. Who of us would think of returning to the one hour test extraction after he had experienced the value of the information to be obtained by the fractional study method. It presents for your elucidation, graphically recorded if you so desire, the acid values of the contents of the stomach at any time you may care to estimate them. Errors of secretion and motility of either the fasting or the digesting stomach can be observed. The time of duodenal reflex can be checked up and matched with the appearance of blood, pus, or duodenal exfoliation in the stomach; a strong confirmatory observation in suspected duodenal ulcer, if they should be coincidental. The time of mucoid impregnation of the contents can be estimated, and microscopic examination can be made of the fasting and digesting residues.

METHOD OF ANALYSIS.

But, to turn now to the detailed description of our method of performing the actual test. Each patient is given the following typewritten instructions preparatory to presenting himself for a gastric analysis:

"At nine o'clock the night before examination eat one meat sandwich (any kind of meat) with twenty raisins or six stewed prunes, and drink a glass of water or cambric tea. Eat or drink nothing after this, either during the night or early morning, until we give it to you in this office at nine

a. m. Do not brush teeth on morning of examination."

This motor meal is to be taken twelve hours before the test is to be started, the principal object of the long fast being to have the stomach empty so as to get a true picture of both the acidity and microscopy of the interdigestive stomach. The purpose in not brushing the teeth is to avoid trauma to the gums with the subsequent misinterpretation of the swallowed blood when found in the stomach. The patient is warned against swallowing post-nasal discharge and bronchial excretion during his waking state.

When the patient presents himself a small sized gastrointestinal tube, with any one of the various metal tips, is passed into the stomach. Note is made of the way the patient takes the tube, whether quietly or with retching, and to what extent the gag reflex is manifested (vago-tonia versus sympathico-tonia) and evidence of cardiospasm watched for. The entire contents of the stomach should be gently lifted out and saved for subsequent examination. The patient is then instructed to place the tube on one side of the throat bringing it out into the buccal space behind the last molar, and in this position he will find that it interferes very little with his comfort in eating the test meal.

In the selection of a test meal we agree with Rehfuess (3), who says: "A fixed test load, simple and accessible, readily withdrawn, and capable of showing both secretory and motor variations, as well as pathological products, is a *sine qua non* as the basis of intelligent analysis of the stomach," and we have long used the true classical Ewald meal of fifty grams of white bread and 350 c.c. of water (as personally taught by Ewald to one of us in Berlin in 1914). Approximately fifty grams of bread is represented by two half inch slices of white bread, three inches by three inches, with the crust cut off.

From the time of the last swallow of bread and water up until the tube is finally removed at the completion of the test, the patient is instructed to expectorate the saliva into a receptacle. The object is twofold; first, to prevent its obscuring the analysis by mechanical interference, and by lowering the acid curve; and second, by recording its amount, an added bit of information is obtained relative to vago-tonia (hyperptyalism) and enzyme activity can be estimated. More attention should be paid to salivary examinations.

Fifteen minute extractions are now made over an average period of two hours, making eight extractions in all. The first seven of these are not to exceed ten c.c. each, and each amount is to be measured and recorded, but at the two hour extraction the stomach is entirely emptied and the amount recovered is to be measured and recorded. The material from each extraction is filtered through gauze or linen, and the filter then tested for starch with iodine solution. In this way the point at which the stomach becomes empty can readily be determined. If the stomach does empty before the two hour period an attempt should be made to continue the extraction of gastric secretion to the end of the two hour test, as much additional information may

thus be obtained. When the stomach is emptied at two hours it is then lavaged with 250 c.c. of water to prove not only that it is empty of the fluid part of the meal, but also that it is empty of bread crumbs which may remain in dependent portions or in gastric crypts. The tube is then removed.

This portion of the test being completed the collected material is examined immediately, if possible. This point is of importance, since evaporation of the samples increases their acidity, and the continuation of digestion changes the relation of free and combined hydrochloric acid. Each sample is examined grossly for amount, chyme, mucus and bile, and chemically for free hydrochloric acid, total acid and occult blood. The fasting stomach content should always be examined microscopically. In testing for acid one c.c. of filtrate is titrated against one one hundredth sodium hydroxide, of which the number of c.c. is multiplied by ten, giving the degrees of acidity for each 100 c.c. of gastric contents. Dimethyldiamidoazobenzol and phenolsulphonaphthalein are used as indicators. In testing for occult blood either a freshly prepared solution of benzidine or the commercial occult blood tablets are to be used. Rutz (4) has shown that hematin granules have a tendency to adhere to other particles in suspension and that, therefore, the sediment gives a more delicate reaction.

With the figures obtained from the titrations a graphic chart of the changes in acidity is constructed, using the degrees of acidity as ordinate and time as abscissa, and making thirty minutes the equivalent of 30°. The total amount of material withdrawn is computed and this is subtracted from the 350 c.c. originally given, and therefore the amount that has passed the pylorus can be noted and a clinical estimation of gastric motility is thus obtained.

We wish here to refer to a further procedure that was first advanced by one of us (Lyon) in 1915 of obtaining the contents of the stomach crypts. The mouth and throat are rinsed and gargled with an astringent mouth wash (liquor zinci formaldehyde) followed by a one grain to the ounce aqueous solution of potassium permanganate, and again with sterile water. The sterile tube is then introduced, and the fasting residuum aspirated and the stomach is washed with 250 c.c. of sterile water at body temperature run in the tube through a glass container elevated about two feet above the patient's mouth, and immediately siphoned to a 250 c.c. graduate on the floor. The inflow and outflow durations are recorded, inasmuch as we feel that this gives us certain clinical data relative to the

state of tonicity of the gastric wall. Repeated washing is done until the return is crystal clear, and unless there is marked gross retention this is usually accomplished in from two to three washings. Then 250 c.c. of a weak solution of zinc chloride and formalin is run in and allowed to remain for one minute, when it is siphoned off. This acts as an astringent and causes the mucous membrane to contract, and the secretions in the ducts are forced out and appear as floccules in the subsequent washings. These floccules are pipetted out of the solution and examined microscopically, or the complete

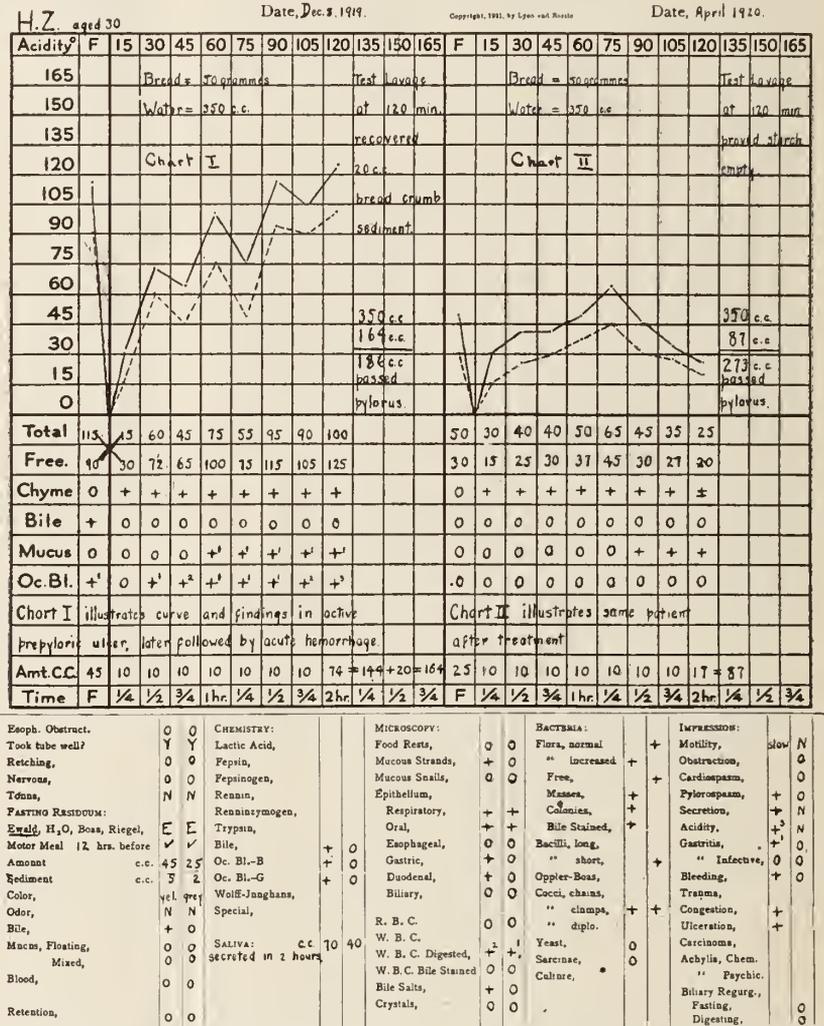


CHART I.—Curve and findings in active prepyloric ulcer, later followed by acute hemorrhage. CHART II.—Curve and findings in same patient after treatment.

sediment may be collected and run through a hardening process, mounted in celloidin and sectioned and stained and examined by microscope, just as any pathological specimen is handled. The technic of the method was presented in 1915 (5), and has proved of great help to us in keeping permanent records of intragastric pathology.

Gastric analysis is primarily a measure of gastric work, fasting and digesting, motor and secretory, as has been pointed out by Rehfuess and Hawk (6), and in order to measure the work done and compare it with a normal, a standard test load must be given the stomach to handle. This measure of work is in reality the measure of the physiological function

of the stomach, secretory and motor, and any deviation from the normal in either acid values or motor activity must be viewed only in the light of pathological physiology. But gastric analysis when intelligently conducted is more than just a measure of the work done, it is an indicator of true intragastric pathology. The evidence of such pathology, however, lies in the addition to the gastric juice of the products of that pathology. These are mucus, exfoliated epithelial elements, pus, blood, and bacterial colonies. And there is a third and equally important side to gastric analysis, namely, that it

findings of regurgitated duodenal epithelium, pus, mucus, and bacteria.

Whenever there is any deviation from the normal values in a given gastric analysis it is of the utmost importance from the clinicians' viewpoint to determine whether these variations are due to intragastric pathology, or are the indirect evidence of conditions outside the stomach. But before the deviations from normal can be appreciated it is necessary that we have some conception of what constitutes normal findings in a test conducted as outlined above. We will, therefore, briefly discuss what we consider to be normal findings as found in patients who not only have no gastrointestinal ailments, but are also free from any general or other local conditions. We will also point out the chief types of pathological curves.

TO CONSIDER FIRST THE TWELVE HOUR FASTING STOMACH CONTENTS.

The amount varies in health from a few cubic centimetres to fifty to eighty c.c., anything above that amount being due either to hypersecretion or retention, that question being decided by the microscopic picture. Sediment up to five per cent. of the total amount recovered cannot be considered beyond normal limits. Mucus that floats is generally freshly swallowed, whereas the type of very viscid, stringy, intimately mixed mucus is usually associated with absence of free hydrochloric acid at that particular period of the gastric cycle. We have found the acid values of the fasting stomach to vary within wide limits. Attention has been called by different writers to the fast and slow motility of normal stomachs, and we feel that there should be a comparable secretory classification of high and low stomachs both within normal limits. It would seem that this question of fast and slow, high and low, is often dependent on the habitus of

the individual, and that this fact must be kept in mind. This accounts for the variations in the acid values in different persons, but we have also found that if the stomach contents of the same individual are examined daily under the same conditions of time, and length of preceding fast, great variations of acid values will also frequently be seen. The explanation of this is, we believe, that the level of acidity in the interdigestive stomach is an expression of a vital function, and like other vital functions it fluctuates from day to day and is easily influenced by such things as loss of sleep, worry, nervousness, or overeating, drinking or smoking the night before the examination.

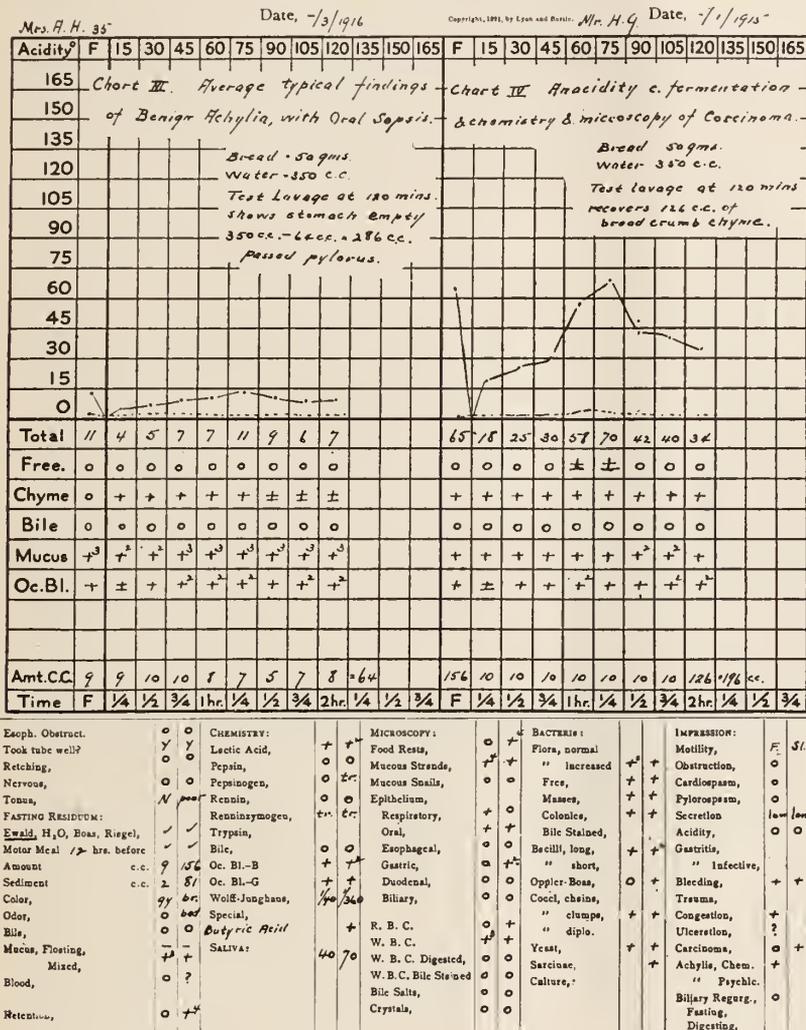


CHART III.—Average typical findings of benign achylia with oral sepsis.

CHART IV.—Anacidity with fermentation and chemistry and microscopy of carcinoma.

serves as an indicator of extragastric pathology. It has long been recognized that most systemic conditions, and many strictly local conditions, even though far removed from the stomach, may influence that viscus. The evidence of such influence is seen indirectly in its effect on the acid curves, and directly by the finding of products of this extragastric pathology added to the gastric secretions. Examples of this latter are the finding of swallowed pus from various sources and the occurrence of occult blood associated with biliary regurgitation which, according to Rehfuess (7), is the only direct evidence of duodenal ulcer to be obtained from a gastric analysis (Chart I). To this should be added the

be seen in the same sediment, and if so each must be examined and the relative amounts noted.

In making a preparation for microscopic examination a small amount of the material is placed on a slide and a cover slip dropped on top. We prefer routinely to use unstained preparations except when searching for particular elements when various differential stains may be used. On looking at this with the high power objective it will be seen that either the cells are practically intact or that the cytoplasm is entirely digested away (Fig. 1), leaving only the more resistant nuclei. The nuclear

and respiratory tract for evidence of infection (Fig. 2). In an acid stomach both the chief and parietal types of gastric cells can be seen, but it must be remembered that these, as well as other cells, are dead or dying, and usually show cloudy swelling (Fig. 3).

In regurgitation from the duodenum the cytology is usually very well preserved if an examination is made promptly. Duodenal cells (round, cuboidal, or oval cells somewhat longer than pus cells) can be recognized, and at times bile stained columnar epithelium from the biliary tract can be seen. The very tall bile stained columnar epithelium we believe is only derivable from the gallbladder. Bile stained pus cells, when found in association with this latter type of epithelium, point to infection somewhere in the duodenobiliary tract (Fig. 4). When bile is regurgitated into a stomach containing free hydrochloric acid, the bile salts are precipitated, giving the material grossly a turbid appearance, and microscopically appear as small clumps and masses of yellow amorphous material. When such regurgitation takes place in an anacid stomach there is no such precipitation. Bile that has remained in the acid stomach for some time assumes various shades of blue and green, due to oxidation or other chemical changes and can readily be differentiated from freshly regurgitated bile from gagging or under reflex causation.

Normally there is no gross or microscopic evidence of food retention in the twelve hour fasting stomach. Retention when found is not pathognomonic of any one pathological process, but it is frequently enough associated with graver conditions in and about the pylorus to necessitate a careful investigation into the causative factor. (Atony, pylorospasm, adhesions, stenoses from inflammatory edema, hypertrophy or from new growth within or without.)

The question of the bacterial flora of the stomach is one upon which much still remains to be written. Bacterial bodies can always be found in the stomach, but whether they are living organisms, and whether they are truly resident in the stomach, constituting an infected gastritis, or only in transit, are points of vital importance to determine. To answer the second question first, bacteria that are in transit are seen as single organisms or grouped in small masses. If, however, visible organisms linger long enough to become implanted in the gastric mucosa they grow in colony formation (Fig. 3) just as colonies grow on the surface of any suitable media.

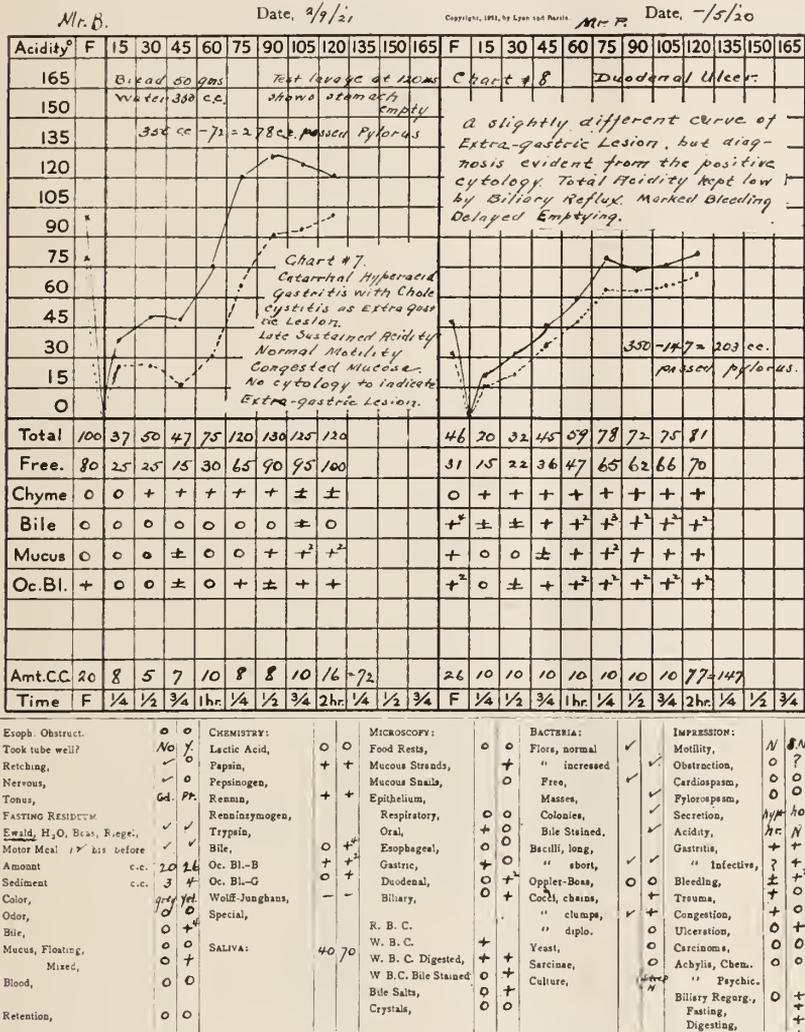


CHART VII.—Catarrhal hyperacid gastritis with cholecystitis as extragastric lesion. Late sustained acidity, normal motility, congested mucosa. No cytology to indicate extragastric lesion.

CHART VIII.—Duodenal ulcer. A slightly different curve of extragastric lesion, but diagnosis evident from the positive cytology. Total acidity kept low by biliary reflux. Marked bleeding delayed emptying.

remains of gastric cells are oval, highly refractive bodies, and the polymorphonuclear cells are seen as groups of two or three small globules. There is always a certain number of leucocytic cells in the fasting stomach, but if these occur in sufficient numbers to constitute pus, they are a distinctly pathological factor. The type of epithelium with which the pus is associated is the deciding factor in locating the point of its discharge, and the finding of a predominance of buccal or respiratory epithelium should lead to a careful search of the mouth

When they become detached and are seen in the fasting stomach contents they are entirely similar to the surface colonies of a Petri culture plate when viewed through a low power ocular. The final answer to the question of viability must depend on culturation, but we feel that for all practical purposes the finding of colonies associated with gastric mucus or epithelium is positive proof of the presence of infection in the gastric mucosa. Particularly is this so if they occur conspicuously in the floccules pressed out from the gastric tubules after washing the stomach clean and then rewashing with an astringent solution. The colonies are microscopically here found associated with exfoliated gastric epithelium, pus cells and inflammatory debris.

To the finding of occult blood in the fasting stomach we do not attach much importance unless the benzidene reaction be very strong and the guaiac reaction positive. This is because, in spite of the precaution taken, it is generally extragastric in origin. It is only definitely of value when the nasopharyngeal and bronchial secretions have been proved to give negative reactions.

Having completed the examination of the fasting stomach content, the next point in the examination is the analysis of the type of curve obtained. We agree with Best (1) who says, "The actual acid value means very little. The shape of the curve means more," and with Rehfuess (9) who says, "There is no pathognomonic curve in any gastric condition," and yet we feel very strongly that there are certain types of curves that point to certain conditions. From a study of many analyses we find that they all fell into one of five groups. Any of these groups, with the exception of the third, can be associated with either hyperacidity or subacidity. The question of the amount of acid secreted in response to the

stimulation of the test meal seems to us to depend on the irritability of the vagus, and the state of fatigue or integrity of the gastric glandulature.

Type I. Normal curve. This is the type of curve in which the apex is reached in from sixty to seventy-five minutes, and a return to within 15° of the fasting values occurs at 120 minutes. It is the type of curve seen in perfectly healthy persons and also in certain early states of intragastric conditions—principally catarrhal. The points indicative of an early catarrhal process are gastric mucopus in the fasting stomach content, and mucus and perhaps traces of blood in the digesting stomach.

Type II. Extragastric curve (Charts VII and VIII). In this type the curve rises steadily during the entire two hour period, or until the stomach becomes empty if there is an associated hypomotility. This is the type of curve that is usually found due to reflex irritation from pathology outside the stomach. It is frequently seen in cases of duodenitis, duodenal ulcer, gallbladder conditions, appendicitis and sigmoiditis. It may be found in association with a clean stomach or with all the evidence of a high grade infected gastritis, but in either case the principal source of

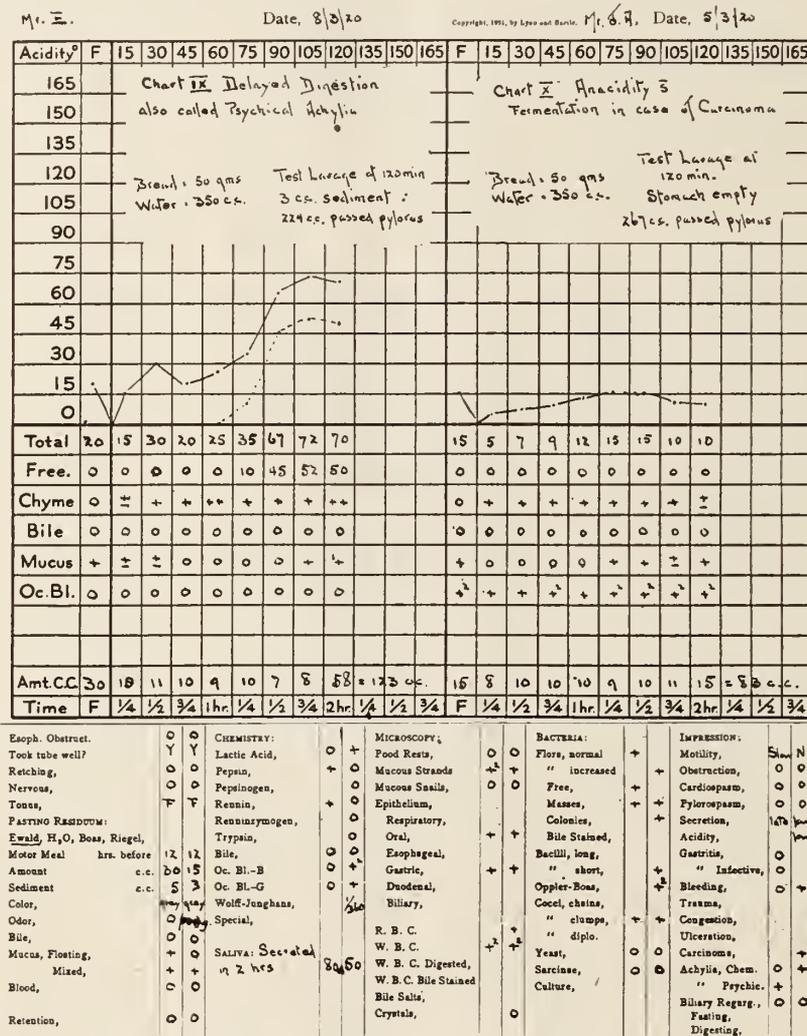


CHART IX.—Delayed digestion, also called psychological achylia. CHART X.—Anacidity without fermentation in case of carcinoma.

trouble is extragastric. (Exception: functional pylorospasm.)

Type III. Achylia. This is a type of curve in which there is no free hydrochloric acid present at any time. It is most frequently seen in cases of malignancy of the stomach in the later stages, in oral sepsis, long standing cholelithiasis, and in the severe anemias, either primary or secondary. Differentiation of the type of achylia comes from the testing of gastric filtrates for organic acids proenzymes and for the soluble albumin and from the microscopic picture. (Charts III, IV, and X.)

Type IV. Stepladder curve. In this type of

curve the smooth ascent is broken by drops in both free hydrochloric and total acid, unassociated with biliary regurgitation, followed by a rise to a still higher level than that preceding the drop (Chart I). This curve is not often seen, but is of grave signifi-

A possible explanation of this type of curve is that the primary rise represents the psychic secretion, and the secondary rise the hormonal secretion. This latter, which should normally pick up and carry on the psychic secretion, is delayed, and therefore per-



FIG. 1.—Hyperacid catarrhal gastritis; A, buccal epithelium digested; B, nuclear remains of digested gastric cells; C, nuclear remains of digested leucocytes; D, mucus spirals (myelin?) in "snail" forms; E, bacteria in clumps and masses.

cance. We have only seen it in ulcer cases in the active stages, and it is generally preceded or followed by hemorrhage. Best (1) illustrates a curve of this type, and notes that there was a recent hemorrhage.

Type V. Delayed digestion curve. In this curve

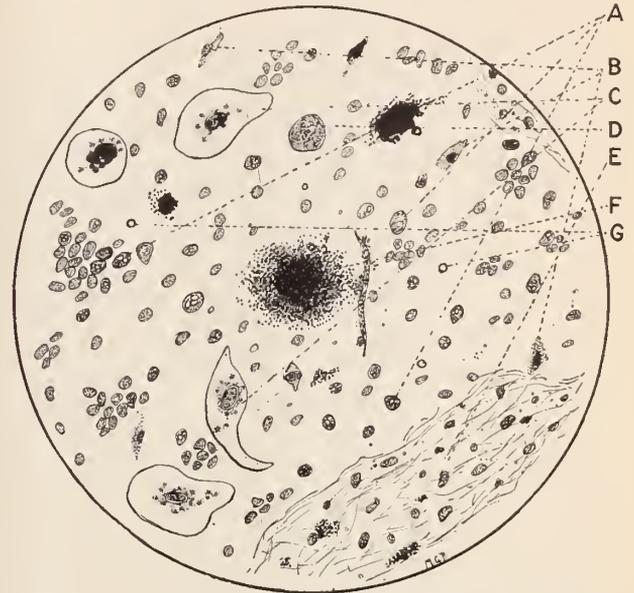


FIG. 3.—Anacid gastritis; A, pus cells, with cloudy swelling of protoplasm, predominating feature; B, gastric epithelium, degenerated; C, buccal epithelium; D, salivary corpuscle; E, strand of mucus, with bacteria and pus cells; F, colony of bacteria; G, red blood corpuscles.

mits of a wearing off of the psychic stimulus and a consequent drop in the acid values.

In addition to the study of the fasting stomach content, and an analysis of the type of curve, there are certain other findings which must be tabulated.



FIG. 2.—Gastric subacidity, with extragastric cytology; A, respiratory and buccal epithelial cells; B, salivary corpuscles; C, leucocytes or pus cells with protoplasm intact; D, colony of cocci; E, occasional gastric epithelial cells.

there is a primary small rise followed by a drop, and then by a practically normal curve. In certain cases of this type the free hydrochloric acid does not come in until the secondary rise, and it corresponds to the psychical achylia of some writers (Chart IX).

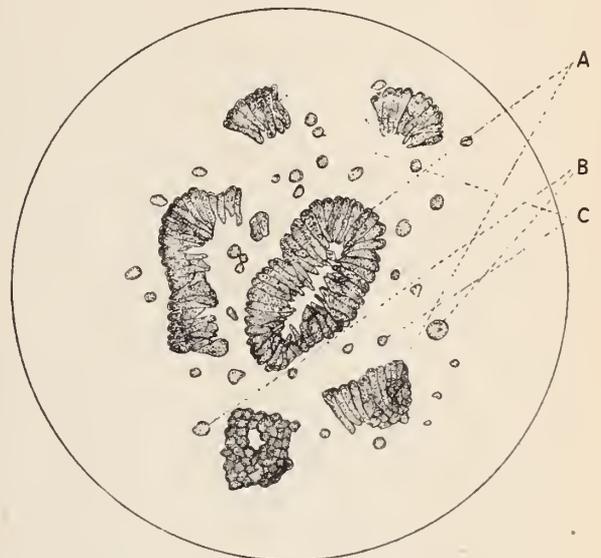


FIG. 4.—Catarrhal exfoliative cholecystitis; A, tall bile stained columnar epithelium from gallbladder, arranged in fan shapes and rosette clusters; B, oval or cuboidal duodenal epithelial cells; C, pus cells or leucocytes, appearing much like duodenal cells but usually smaller. Note: The nuclei can be brought out by adding dilute acetic acid.

The motor element is of great importance, and when carried out as detailed earlier in this paper, we believe will give a more accurate estimate of gastric motility than the x ray examination for six hour

barium retention or from any other unphysiological test meal. In all cases of achylia the associated tests mentioned above should be done. The details of these reactions do not fall within the scope of this paper, but can be found in any standard work on the stomach.

Mucus, when found in all the extractions, especially when associated with low salivary output (gauged by measuring the amount of saliva spat out during the two hour test), is probably swallowed; whereas mucus, appearing only in the second half of the examination, is generally gastric in origin. The interpretation of bile in the digesting stomach has been discussed above and need not be repeated here. The finding of blood in the digesting stomach must not be taken as evidence of ulcer or neoplasm unless the evidence of careful history and physical and x ray examinations lend their support to such a diagnosis. It is more often to be interpreted as mucosal congestion with diapedesis, or due to miliary erosions, and should lead to a careful examination of heart, lungs and liver and for obstruction in the portal circulation. We consider the finding of occult blood in the gastric filtrates as of much more importance than its demonstration in the gastric residues. The number of times that it appears in the fractional analysis also adds greater significance to its finding.

In closing we want to say a word about the diag-

nostic and prognostic value of repeated fractional gastric analyses. We have found this method of checking our findings of the greatest practical value (Charts I and II). It is especially useful in cases where repeated x ray examinations cannot be obtained, because it gives a very accurate picture of the motility of the stomach, as well as its secretory curve. It has also been of value in following the progress of medical treatment, and in estimating the benefit derived from surgical interference (Charts V and VI). In many cases, with complete arrest of symptoms, it will be found that the fractional analysis has not returned to normal, and unless treatment is continued a relapse is quite likely.

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Personal Experiences with Nonsurgical Biliary Drainage*

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It is a well recognized fact that the medical treatment of gallbladder affections has been quite unsatisfactory, and that even surgery does not always afford the relief which should be expected from procedures of this character. The very fact, for instance, that the choice between such operative procedures as cholecystostomy and cholecystectomy has not as yet been fully established among surgeons is evidence sufficient to attest to the truth of this assertion. Disregarding the immediate operative risk, which is usually slight, the subsequent results as they are observed by the family physician months, or even years later, in the form of recurrence of pain due to a return of the original affection or adhesions, producing digestive disturbances of various forms, are all too frequently the evidence of unsatisfactory operative measures, which are alike distressing to the patient as well as to the physician. It is on this account that we must welcome any new measure that may render the diag-

nosis as well as the treatment of biliary affections more satisfactory.

Based on Meltzer's observation that a twenty-five per cent. solution of magnesium sulphate introduced locally into the duodenum causes a relaxation of the sphincter of the common duct and according to his law of contrary innervation a contraction of the gallbladder, Lyon evolved his method of diagnosis as well as a method of nonsurgical biliary drainage. This plan has marked an advance in the study and treatment of these affections. We have employed this method in cases totalling three hundred and fifteen single observations. The technic is quite simple and in many instances the treatment has been carried out for us by nurses and later on by the patients themselves.

DESCRIPTION OF PROCEDURE.

With but few minor modifications the original plan of Lyon's has been followed. The patient is instructed to fast, and with the exception of a glass of water, if this is desired, nothing else is allowed

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after ten p. m. on the evening before the treatment is instituted. At nine a. m. on the following day, after the teeth have been brushed thoroughly, the mouth cleansed and throat gargled with an antiseptic solution, the tip of a freshly sterilized duodenal tube is placed in the back of the mouth and swallowed with a sip of water. After the tube passes into the stomach, lavage is practised at first with water until the wash water is returned sparkling clear and again with 250 c. c. of a one to 10,000 solution of potassium permanganate, as much as possible of which is immediately recovered. We have practised lavage of the stomach when obtaining cultures only to avoid contaminations and when considerable mucus was present in the stomach. The patient is then ordered to lie on the right side and to swallow very slowly an additional twenty cm. of the tube totalling a distance of from seventy-five to eighty cm. from the incisor teeth. This process should consume about twenty minutes. During this procedure swallowing efforts are repeated at regular intervals. A large swallow of water frequently facilitates the passage of the tube into the duodenum. At times the passage into the duodenum is accomplished in ten minutes and rarely does it consume longer than an hour. Before proceeding further it is necessary to determine whether entrance into the duodenum has been effected. According to our experience, the most reliable evidence in this respect is the change occurring in the color and character of the aspirated fluid. The fluid assumes a canary yellow color which soon turns to an amber hue; and the character changes from a tenacious mucoid liquid to a clear, limpid, alkaline fluid which at times presents suspended floccules. Another method of value in determining this fact is the failure to withdraw any fluid swallowed, such as broth or milk. The so-called duodenal tug is obtained but rarely and cannot always be relied upon. The röntgen ray is the method *par excellence*, but for obvious reasons cannot always be employed. Recently Palefski suggested inflating air slowly through the tube and if it has passed into the jejunum the lower abdominal quadrant will become distended and tympanitic, and the patient will neither eructate nor complain of discomfort.

After being assured that the bulb has passed the pylorus, the tube is connected with an aspirating bottle and the duodenal secretion obtained. Under normal conditions the common duct sphincter is frequently found closed and then but little or no bile can be aspirated. Fifty c. c. of a warm sterile thirty-three and one third per cent. solution of magnesium sulphate is then injected into the duodenum. The duodenal tube is again connected with the aspirating bottle and the magnesium sulphate siphoned off. In a few moments bile mixed with the magnesium salt appears in the glass cannula inserted in the tube. At times it is necessary again to stimulate with half the amount of magnesium sulphate to secure a flow of bile. We have not infrequently restimulated with fifty c. c. of hot water or broth with unusually good effect. The first bile obtained is considered common duct bile, and requires from one to three minutes to collect, the amount varying from ten to twenty c. c. It is clear, light yellow in color, with but traces of mucus.

Suddenly a transition occurs, the bile becomes darker and more viscid. This is gallbladder bile and is collected in a separate receptacle, appearing normally in amounts of from thirty-five c. c. to ninety c. c. Soon a third change occurs, when a thinner yellow bile appears in the glass cannula, which is then drained into a third bottle; this is freshly secreted liver bile which occurs normally in amounts averaging about ten c. c. When the aspirated fluid returns clear, which occurs after a variable period of time, 250 c. c. of warm Ringer's solution is slowly injected into the intestine to wash out any of the injected material that may have escaped into the bowel. This plan is followed for diagnostic purposes, but in the subsequent treatments no attempt is ordinarily made to segregate the various specimens of bile. Before treatment is instituted it is well to investigate and eradicate thoroughly all foci of infection, such as the teeth, tonsils, and paranasal sinuses, and on the other hand it is of great importance to note that the source of the focal infection may be located in the gallbladder itself and that this method presents a means of thoroughly investigating this possible focus. Cultures are taken of the common duct, gallbladder and liver bile, before, during, and at the end of a course of treatment. In quite a number of instances among our cases, Dr. C. E. Simon has discovered pure cultures of streptococci and staphylococci which have largely disappeared in a number of instances after prolonged treatment. No attempts were made by us to use autogenous vaccines in the treatment of any of our patients.

Before applying this method in the diagnosis and treatment of biliary and duodenal lesions, a knowledge of the normal appearance of the bile and duodenal secretions is of primary importance. As has been pointed out, in the fasting state the common duct sphincter is normally closed and the duodenal content is free of bile. It is alkaline in reaction, pearly gray, fairly transparent, syrupy, and stringy in consistency, and contains a few suspected floccules. The bile flows intermittently quite like the secretion of urine into the bladder through the ureters. This characteristic feature is especially manifested when the freshly secreted liver bile is being collected. The bile as it is obtained through a duodenal tube under normal conditions undergoes certain definite changes in color and viscosity, according to Lyon, first from a light lemon to a golden yellow then to a deeper, richer, viscid, more syrupy golden yellow to dark brown, and finally to a uniformly light lemon yellow, thinner and less syrupy than either of the first two specimens. Microscopically, normal gallbladder bile is free from pus cells and contains a few epithelial cells, bile crystals and traces of mucus. Bacteriologically, no pathological organisms are observed. Chemically, the bile is alkaline in reaction and contains the biliary pigments—bilirubin and biliverdin; the biliary acids—glycocholic and taurocholic, cholesterol, lecithin, fats, etc.

The diagnosis, as Lyon describes it, is then developed around the direct study of the bile and the manner of its discharge, on the gross appearances of the several specimens—the quantity, color, consistency, viscosity, transparency, turbidity, floccula-

tions, mucus, etc.; the cytological examination—epithelium, whether bile stained, its source, pus cells, crystals, concretions, red blood corpuscles, inflammatory debris, mucus, bacteria; into the chemistry—lecithin, cholesterolin, calcium, pigments, effervescence on acidification, etc.; and into the bacteriology by culturation of each of the segregated samples of the bile.

Failure to obtain gallbladder bile after stimulation with magnesium sulphate indicates complete obstruction of the cystic duct either due to stones, adhesions, or pressure from without by a tumor. Failure to obtain the clear, lemon yellow bile or common duct bile is indicative of common duct obstruction. Of course, neither gallbladder nor common duct bile is obtained when the common duct is obstructed. In these cases it is interesting to note that frequently, by means of fractional analysis of the duodenal contents, the pancreatic ferments are markedly diminished or absent. A mucoid discharge, bile tinged with flakes of red blood corpuscles followed by a thin watery discharge, has been frequently observed by us in cases of partial obstruction of the common duct, while an excess of gallbladder bile, that is, over ninety c. c., is indicative of gallbladder stasis. A diagnostic measure, which we have observed in a fair proportion of cases and which is of considerable value, is the pain produced immediately upon the introduction of the magnesium sulphate solution which is much like a mild gallbladder attack and is analogous to the pain occurring in cases of strictured ureters or in Dietl's crises when fluids are instilled into the pelvis of the kidney. Inspissated mucous or tarry bile; extreme atony or atrophy of the gallbladder; absence of bile in the gallbladder, the contents consisting of calculi only, are other conditions in which the recovery of bile may be impossible even after stimulation.

The chemical investigation into the composition and physical properties of bile is yet in its infancy and it is very probable that in the future much additional light will be thrown on this subject whereby the diagnosis of biliary conditions will be materially aided.

We have also noted, as Lyon has pointed out, in some instances a sudden turbidity in a clear bile will develop during drainage, which is due to the sudden passage of acid into the duodenum. The same condition can be produced artificially by adding dilute hydrochloric acid to bile in a test tube. Lyon has also encountered clear bile in which an effervescence, as well as a turbidity, was produced on adding hydrochloric acid, similar to the reaction of acetic acid and calcium phosphate in the urine, and it has been suggested on this account by Lyon that "we may possibly be dealing with calcium phosphate stones, potential or formed in the gallbladder."

In our study of the three hundred and fifteen patients on whom biliary drainage was practised all were cases that presented gallbladder disturbances in some form or another. Of these there were thirty-one cases of cholelithiasis, fifteen of obstructive jaundice, one hundred and forty-nine of cholecystitis, and one hundred and twenty of biliary stasis due to gallbladder atony. The diagnosis in a number of these cases was verified by operation, but

the clinical manifestations in all were so distinctive, while the x ray and laboratory findings presented such corroborative evidence, that there could be but little doubt as to the correctness of the diagnosis.

CHOLELITHIASIS.

This method of examination was found of value as an aid in the diagnosis in a number of our thirty-one cases of cholelithiasis. A dark turbid bile containing numerous microorganisms, with large quantities of mucus and pus and an increase in the cellular elements, is indicative of the presence of an infected gallbladder, and when such signs are accompanied by paroxysmal attacks of pain radiating under the right costal arch toward the back they are of considerable value in the diagnosis of cholelithiasis. But little can be expected from this form of treatment as a means of cure in this disease; on the other hand, the method is of undoubted value following operations as a means of overcoming infection and thus acting as a preventive measure in the recurrence of gallstones. It also enables us to give relief from discomfort and even from pain which still remains following the removal of calculi.

OBSTRUCTIVE JAUNDICE.

Of our fifteen cases of obstructive jaundice, eight were instances of catarrhal jaundice and seven of obstructions due to other causes. The inability to obtain the gallbladder bile in these cases may be explained in one of several ways:

1. To a cystic duct obstruction in which repeated efforts may fail to obtain gallbladder bile and in which there is also often present a catarrh of the common duct.

2. To inspissated bile too thick and ropy to flow through the duct or in which the duct contains calculi causing obstruction to the flow. In the first of these conditions repeated daily drainage is likely, after a longer or shorter period of time, to be followed by a free flow of bile with the disappearance of the jaundice.

3. To pressure on the duct from without, as by tumors.

In cases of catarrhal jaundice our experience is entirely in accord with that of Lyon. The duration of the jaundice is lessened by this plan of treatment and recovery greatly hastened. In all of our cases the jaundice had entirely disappeared within ten days to two weeks. We have also observed in all of our cases of obstructive jaundice that by means of fractional examination of the duodenal contents the ferment values are markedly diminished.

CHRONIC CHOLECYSTITIS.

In our one hundred and forty-nine cases of chronic cholecystitis the most brilliant results were achieved by biliary drainage. This condition is demonstrated by obtaining gallbladder bile containing much mucus and a slight increase in leucocytes and with large numbers of microorganisms (streptococci, staphylococci, micrococcus catarrhalis, or colon bacilli) often in pure cultures. When the leucocytes are markedly increased in numbers and are largely of the polymorphonuclear type, the condition points to an acute stage of the infection which may pass into

the suppurative type and lead to an empyema. In cases of chronic cholecystitis our labors are frequently rewarded by noting a gradual reduction in the number of colonies of organisms as the treatment progresses, with marked improvement in the patient's condition.

BILIARY STASIS.

One hundred and twenty cases in our series were due to biliary stasis; these present an interesting group. Lyon has called attention to this condition and has pointed out that many cases of so-called biliousness are really instances of biliary stasis. The condition is due to an atony of the gallbladder, the degree of which may vary from a moderate weakness of the walls of the gallbladder to a stage in which the gallbladder is no longer able to discharge any of its contents. According to our experience the normal amount of gallbladder bile varies between thirty-five and ninety c. c.; an amount obtained over ninety c. c. is indicative of gallbladder stasis. In this condition the bile is ordinarily of the static variety; very thick, tarry in character, requiring usually many attempts before the gallbladder can be thoroughly cleared, and it is infected with many microorganisms. With daily treatments often extending over many weeks such cases can be greatly benefitted, the bile assuming after a time a more normal appearance, the microorganisms gradually decreasing in numbers, and the patient then presenting a marked improvement in his condition. It is quite probable that in many of these cases the formation of gallstones can be prevented by this form of treatment.

There is a large series of cases to which attention has already been drawn and which are grouped under the term biliousness. Such patients are sallow in appearance, weak, affected with indigestion and constipation, and are frequently the subjects of sick headaches and migraine attacks.

Our observations regarding this condition are entirely in accord with those of Lyon, that in many of such cases severe types of biliary stasis are observed due to atonic infected gallbladder. By means of biliary drainage it is not unusual to observe a rapid change in the appearance and strength of the patient and an improvement in the digestion and constipation, with complete relief from the acute attacks.

CASES EXAMINED.

The efficacy of this new procedure is well illustrated in the following two cases:

CASE I.—Mr. J. S., aged fifty-five, had his gallbladder drained and adhesions liberated in 1915, following years of indigestion and mild though typical gallbladder attacks. No stones were found. The patient was apparently well until four months ago, when attacks of colicky pain in the upper right abdomen reappeared. The x ray and bile examinations corroborated the diagnosis of an upper right quadrant affair. The patient reported for treatment and was perfectly willing to submit to a surgical procedure. After four weeks of daily bile drainage treatments the patient was dismissed entirely well, with the bile free of any infection. We have heard from this patient recently and he writes that he has

been perfectly well, but he still employs the duodenal tube every two weeks as a factor of safety.

CASE II.—Mrs. W. B. P., aged forty-three, had typhoid fever at the age of sixteen, and ten years later began to complain of acidity, gas, and fullness in the abdomen after eating. Shortly afterward, typical, severe gallbladder colic attacks appeared followed by jaundice. These attacks increased in severity and frequency until it was deemed advisable to operate. In March, 1917, Dr. Finney removed a gallbladder filled with stones. For one year there was complete relief, when the attacks of pain followed by jaundice reappeared. Dr. Charles H. Mayo made an exploration in the early part of 1918, and found a strictured common duct, due to adhesions. No stones were present. Then followed a period of absolute freedom from attacks for over a year when they reappeared identically the same but of increased severity, and for the past six weeks a protracted attack with jaundice and pain required the constant administration of morphine for relief. On account of her past operative procedures it was deemed advisable to institute non-surgical biliary drainage. After a few weeks' treatment the patient was also entirely relieved. At the present writing she is still employing the treatment at intervals of two weeks.

CONCLUSIONS.

1. The method of biliary drainage, as instituted by Lyon, furnishes a valuable aid in the diagnosis of gallbladder affection. It is particularly valuable in that it enables us to diagnose these conditions early before evidences of complications have manifested themselves.

2. It presents an important means of determining the presence of focal infection in the gallbladder, a condition which may be of the greatest therapeutic and diagnostic value in obscure conditions.

3. While this method of treatment is still in its infancy and is as yet too new to draw conclusions regarding its end results, there can be no question that it furnishes us with a means of affording definite relief in certain biliary affections for which hitherto radical measures have been required. It is an extremely valuable aid in the treatment of catarrhal jaundice, biliary stasis, and gallbladder infections, and is helpful in relieving the infection which may still remain following gallbladder operations.

BACTERIOLOGICAL STUDY.

The following bacteriological study was made by Dr. Charles E. Simon, of Baltimore.

Until very recently very little was known of the bacterial flora of the bile. It had been ascertained that in most if not all cases of typhoid fever typhoid bacilli appeared in the feces at some stage of the disease, and that these come more commonly from the gallbladder than from the intestinal ulcers. A certain degree of cholecystitis it was ascertained occurred in practically all cases of the disease and the persistent elimination of typhoid bacilli by fecal carriers was found to be due to a persistence of the infection of the gallbladder, which not infrequently was associated with the development of gallstones. These findings were based in part upon postmortem investigations and in part upon opera-

tive procedures which had been called for by the existence of stones.

PRESENCE OF COLON BACILLI.

Colon bacilli have also at times been encountered in the bile at autopsy, and, as Welch has shown, they occasionally occur in gallstones, which proves that the infection of the gallbladder with these organisms may take place *intra vitam* and is not necessarily a postmortem event.

In cases of acute cholecystitis streptococci and staphylococci have further been encountered at operation, but little attention has been paid to such observations. The various works on surgery and pathology up to the present time offer very little information indeed on the subject under consideration.

The systematic study of gallbladder infections has as a matter of fact been inaugurated only since Lyon called attention to the comparative ease with which bladder bile can be obtained through the duodenal tube, after stimulating the duodenal mucosa with magnesium sulphate.

FREQUENCY OF INFECTION.

The data which have been obtained in this short interval of time are very interesting from many points of view. They show very clearly that bacterial infections of the gallbladder are much more common than had hitherto been supposed, and that infections with pyogenic cocci are much more frequent than bacillary infections. Whatever the therapeutic value of nonsurgical drainage of the gallbladder may ultimately prove to be, so much is certain that as a method of diagnosis the bacteriological study of the bile has already assumed a position which must rank as equal in importance with other standard methods of examination. No search for foci of infection can hereafter be regarded as complete which does not include an examination of the bile.

METHOD OF PLATING.

It is not the purpose of the present paper to enter into a detailed discussion of the technic which is to be employed in the bacteriological study of the bile. It is merely intended to present in concise form the findings which were obtained in the course of a routine examination of seventy-eight specimens of bladder bile from forty-seven different individuals, such as they were received from Dr. Friedenwald's clinic. It may be mentioned, however, that in every case the specimens were plated out both on blood agar and upon Drigalski-Conradi's medium. This is absolutely essential. A mere examination of smears will furnish an altogether erroneous impression of the true situation. The latter method should never be employed alone.

BACTERIA FOUND.

No organisms of any kind were found on seventeen occasions. Saprophytes, for the most part spore bearers, were encountered thirty-one times; diphtheroids, twice; colon bacilli, six times; staphylococci, twenty-seven times, usually *Staphylococcus aureus*, on three occasions *Staphylococcus albus*; large gram negative side to side diplococci which were viewed as *Micrococcus catarrhalis* twice and hemolytic streptococci five times; on two occasions

capsulated diplococci were encountered, but not identified.

NUMBER OF COLONIES.

The number of colonies per c. c. of bile varied within wide limits, viz., between 100 and 750,000. In some cases a striking diminution was noted on successive examinations. In one instance the following figures were obtained:

November 27, 1920.....	12,500 organisms to the c. c.
December 15, 1920.....	6,250 organisms to the c. c.
January 13, 1921.....	9,000 organisms to the c. c.
February 4, 1921.....	0 organisms to the c. c.

In another case the figures were the following:

February 7, 1921.....	11,250 organisms to the c. c.
February 25, 1921.....	4,500 organisms to the c. c.
March 8, 1921.....	0 organisms to the c. c.

In other cases, on the other hand, no change was observed. Single infections were the exception. Leaving the saprophytic organisms out of consideration the findings were the following:

Staphylococci alone.....	11 times
Streptococci alone.....	15 times
Colon bacilli alone.....	2 times
Staphylococci together with streptococci.....	5 times
Staphylococci together with colon bacilli.....	2 times
Staphylococci, streptococci, and colon bacilli.....	2 times

Of special interest was one case, an old gallbladder infection, in which *Bacillus subtilis* was encountered again and again as the only organism that developed on the blood agar plates. At operation the same organism unaccompanied by any others was cultured directly from the gallbladder. Following the removal of the gallbladder the bile was found to be sterile on subsequent examinations.

ABSENCE OF TYPHOID ORGANISMS.

Typhoid bacilli were not found in any of the cases. But it is well to bear in mind that Bogart found that in typhoid carriers the organisms could be demonstrated much more readily and much more constantly in the bile than in the feces. In suspected cases this method of examination should always be employed when fecal examinations give negative results.

METHOD OF INFECTION.

It would, of course, be tempting to speculate upon the manner in which the gallbladder becomes infected in those cases in which no history of a severe systemic pyogenic infection can be elicited, whether the organisms gain entrance by way of the common duct or whether they reach their destination through the circulation. From the available data we are scarcely in a position to reach a conclusion. It would be interesting to conduct bacteriological blood examinations as a matter of routine in large series of cases of tonsillitis and so-called winter infections, to determine whether organisms do not pass through the circulation in these maladies, which are so commonly regarded as unimportant and which we are coming to look upon more and more as really serious. During those febrile flareups, which one meets so frequently in individuals with badly infected teeth, blood cultures would also seem to be indicated, and, as we have already pointed out, no search for pyogenic foci can hereafter be regarded as complete in which the condition of the bile has not been adequately investigated.

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Gastroenterological Gleanings from the Mayo, Sippy, and Boston Clinics*

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Before my departure I had in mind certain definite problems on which I wanted light. Some of them were:

1. How to diagnose cancer early enough to be operable. 2. How to recognize with greater sureness ulcers of stomach and duodenum in the early stages, before perforation occurs, and before adhesions and deformities have taken place. 3. How to differentiate more definitely the symptomatology of organic disease from functional disturbance. I also wanted to get a clearer conception of functional disease, or so-called neuroses, one sees so much of, and so frequently mistakes for organic trouble.

THE MAYO CLINIC.

To solve one or all of these problems I betook myself to America's medical Mecca, the Mayo Clinic at Rochester. I arrived there on a Saturday afternoon, and on my way from the station I inquired of the taxi driver where St. Mary's Hospital was, thinking that was where the Mayo Clinic could be located. I was informed that it was two miles away from my hotel, so decided to wait until Monday to visit the clinic. Late in the afternoon, while walking out to see the town and before I had gone more than a few steps from the hotel, I saw people coming from every direction toward the hotel. I walked around the corner and looking up at the front entrance of an imposing building, I saw the inscription Mayo Clinic. I stopped in amazement and watched the people going in. There were hundreds; old and young, on foot and in wheel chairs, lame and straight. Many had dressings around their necks and many others carried bundles under their arms, the bundles happening to be gallon bottles wrapped up neatly and containing urine (twenty-four hour specimens). For many minutes I stood and watched the crowd. It was Saturday, when the Clinic is usually closed, but since it was the fifth of July and the Clinic had been closed on the Fourth, it was impossible to close it an extra half day. That was the reason so many people rushed to the place for examination, advice, or treatment.

To the newcomer it was a sight not easily forgotten, and it would require the pen of an artist like Zola, who described similar scenes at the French Grotto at Lourdes, to do this scene justice.

I walked in, following the crowd, and saw an immense waiting room, more like the beautiful foyer of a hotel than a waiting room in a hospital, in which hundreds of patients were waiting. Upon inquiry, I learned that about three hundred new patients register daily. When I presented my letter of introduction from Dr. John B. Deaver, I was cordially received by Dr. Eusterman, chief of the gastroenterological department. I told him my

mission, and the first thing he did was to take me up to their splendid library and gave me to read the introductory chapter of the *Oxford Loose-Leaf Medicine*, by Dr. MacKenzie. Weeks later I realized the significance of that act. Those of you who read abstracts of Dr. MacKenzie's papers or addresses while he was in this country recently will remember that he evolved a new philosophy of medicine, distinct from the German conception which prevailed hitherto. I shall not enter into this at present; suffice it to say, that the main principle is the recognition of the diseased condition, not by signs and symptoms derived from gross pathology and the postmortem room, but by functional disturbances which precede gross pathology. In other words, we should endeavor to recognize conditions in their incipiency. The spirit pervading the article is that of rugged common sense and sane conservatism. The same spirit I found pervading the Mayo Clinic.

Fully half their patients are sufferers from gastroenterological disease. All are given a thorough physical and routine laboratory examination, including uranalysis, blood tests. (very frequently a Wassermann), chemical analysis of the gastric secretion, and x ray examinations. For the past six months only, they have used the fractional method of gastric analysis, but in a modified form on account of lack of time; instead of every fifteen minutes as Rehfuess directs the secretions should be extracted, they do it every forty minutes for three specimens. Before the tube is removed a test is made of the acidity. If achylia is present then the tube remains longer and more specimens are withdrawn. However, if acid is present in the first three specimens, the remains of the test meal are withdrawn until the stomach is empty. If 200 c.c. are recovered, it speaks for retention. This is strengthened by the fact that on examining this residue, bits of raisins and rice are found. These facts are carefully noted on history charts; the patient is then referred to the x ray laboratory.

All such cases are fluoroscoped and plated. Fluoroscopy is done by Carman himself. From fifty to sixty patients are referred to him every afternoon. He works rapidly and his vast experience enables him to see in a flash what it would take others many minutes to see. The element of time is here also a great factor. He cannot wait to observe the normal action of each particular stomach, but by quickly forcing the barium into the duodenum, it becomes distended and better visualized, and the outline can be seen either clearly defined or deformed. If the latter, it indicates, of course, organic disease. Only fifteen per cent. of the cases sent to him are diagnosed as organic in nature with a definite pathology. Now, remembering that all the cases are special cases, the patients coming from

*Read before the Mt. Sinai Hospital Clinical Society, Philadelphia.

afar, not only highly neurotic city bred individuals, but the majority farmers, ranchers, and country people, I questioned in my mind about the remaining eighty-five per cent. The fifteen per cent. with organic disease represent the far advanced cases, with marked pathological development, for which there is hardly a need for the x ray. I expected to see this important laboratory procedure of service in less marked cases. Assuming that fifty per cent. of the cases were sent as a matter of routine, there still remained thirty-five per cent. which presented definite clinical signs and might have been overlooked for lack of time to study them. I have seen patients brought to the operating room and a diagnosis of duodenal ulcer made, but upon exploration several gastric ulcers were found and these had been missed by the x ray.

Fluoroscopic examination is considered at this clinic of the greatest importance. Plates are made simply to demonstrate the lesion and sometimes to bring out doubtful points which do not clearly show on fluoroscopy. A definite diagnosis is based, first, on the x ray; second, on the history, and third, on chemistry. On rare occasions, however, when the x ray is negative and the history suggestive of ulcer, the order is reversed. In my judgment history should always be first, provided one knows how to elicit a proper history; the x ray should be second, and chemistry third. The evidence of this trinity should always be taken together.

During operation, the Mayos philosophize on the relation between ulcers and cancers, their etiology, treatment, and the relative merits of medical and surgical treatment. Very often, they take a fling at the medical man, and Sippy, the exponent of medical treatment, comes in for sarcastic remarks. The Mayos, of course, uphold the surgical treatment of gastric and duodenal lesions. The younger men, however, do not share this extreme view, but admit that certain cases are amenable to medical procedures. In a recent article, the Mayos even advise a reasonable medical cure before surgery is resorted to. This feeling is widespread now even among surgeons. I was watching the examination of a patient by Dr. Eusterman, when he turned to me and said, "Sometimes we are compelled to make a diagnosis for geographical reasons," and he showed me a man who came from Alaska, complaining of pain in the right quadrant. Localization was not definite, but nevertheless, a diagnosis of subacute appendicitis was made and an operation ordered, simply because the patient lived too far away from a reputable surgeon. If he had lived nearer, he would have been sent home for the further development of more severe symptoms and a more definite pathology. At operation, however, a large stone was found in the gallbladder, which undoubtedly accounted for his symptoms.

I have dwelt so far on the diagnostic and medical sides of my observations and have not said a word concerning the surgical aspect, the reason being that I am not competent, since I am not a surgeon. However, my opinion as a medical man is that their surgery, technically speaking, is superb. They believe in large incisions, and they believe in seeing what they are doing. The importance of this,

I leave to the surgeons to discuss. Their work, no matter how complicated a condition may be found, seems comparatively easy to the onlooker. On the other hand, I have seen a surgeon in Chicago do a gallbladder operation through a small incision, and he literally sweated blood.

All the stomach cancers I have seen operated upon were inoperable. This was very discouraging to me. I thought to myself that the patients either arrived too late, or the diagnosis was delayed too long for definite and classical symptoms. I have seen a man there with a history of pain, some loss of weight, and a slight degree of dilatation and retention, as shown by the x ray and gastric findings. Yet, he was sent away for six months after which time he was to return and report on his condition. Suppose he had an incipient cancer which was operable, in six months becoming inoperable? I saw another patient opened up for inoperable cancer who had been in the clinic a year previous to operation, but who could not stay longer for observation and perhaps operation. Dr. Mayo told us that surely the man must have shown symptoms of cancer and if he had been impressed with its seriousness he would certainly have submitted to surgical treatment. On the other hand, they do wonderful work in intestinal cancer. The slightest pain in the abdomen with mucous or bloody stool is thoroughly investigated by proctoscopic and sigmoidoscopic examination, as well as x ray, and thus they are able to discover the earliest manifestation of malignant changes. Wonderful results follow their resections.

In mentioning some of their errors, as I have done, I do not wish in the least to depreciate the Clinic in any way; I simply desire to point them out as human errors, which are inevitable as a part of so much clinical material and so much excellent work which may depend on extraneous factors, such as economy of time, lack of sufficient space where patients may be observed for a longer time, and perhaps lack of sufficient medical help.

My method of observation was entirely original. Many patients were registered at my hotel while they were undergoing examination, and as all patients like to talk, I had no difficulty in eliciting a history of their complaint. When I told them my reason for being in Rochester, they were pleased that I took an interest in them. In this manner I was able to follow up many patients from clinic to operating room.

Usually physicians go to the operating room and look on the procedures which are well nigh perfect and very interesting to the surgeon. As I was not much interested in the surgical technic, but more in diagnosis, I had to be shown the why and wherefore, and so I looked for it. I read histories, looked at charts, and wanted to know the reason for operation. In this way I came across many curious and interesting conditions. One day I came into the operating room where a patient, already under ether, was being prepared for operation for varicose veins. Her legs were exposed preparatory to the application of iodine and I looked again and again, but could not see any varicosities. Well, I thought to myself, they might perhaps be collapsed;

but, yet, one should see their tortuous course. The patient was a big woman, "fat and forty," from South America, I believe. I walked over to the wall where the charts were and read some of the history. In brief it was as follows: Chief complaint, bearing down pain. The patient had had varicose veins, but there was also a history of gastric distress with jaundice several times. Patient vomited bile, had sour stomach, and was bloated after meals. Tenderness under right costal margin was present. Now you all know what Dr. Deaver would have operated upon this patient for, and yet the simple operation for varicose veins was performed. Can Dr. Deaver blame the medical man alone for procrastination in gallbladder surgery?

Another case that interested me greatly was that of a man of fifty, who was operated on for the removal of an impalpable and invisible thyroid, for the only reason that he had a persistent tachycardia and a high basal metabolism, which was plus forty-five; and this to them indicated a thyrotoxic condition. The operation was performed to save his heart from further myocardial damage. No such patient would have been operated upon here. Their immense experience in thyroid surgery entitles them to our confidence in their better judgment.

Fully half of my time I spent in their splendid library, which was a beehive of activity. Here one meets the chiefs pouring over some old periodicals, or the younger men engaged in research on problems assigned to them, or visiting physicians who wish to supplement their observations by reading. Here I read Dr. Deaver's paper on gallbladder pathology, where he blames the medical man for not recognizing gallbladder disease early enough. I carefully read and digested the original papers of the Mayo staff and assistants, regarding the etiology, pathology and bacteriology of gastric and duodenal ulcers.

As you know, Rosenau isolated a specific streptococcus causing ulcers of stomach and duodenum. He was able to reproduce these ulcers in the stomach by the injection of certain types of streptococci. Luigi Durante, of the clinic, experimentally produced gastric lesions through the artificial perversion of the nerve supply of the stomach and the duodenum. F. C. Mann made a study of gastric ulcers which followed the removal of the adrenals, and so I have learned that a real, chronic or mucous ulcer may begin as a neurosis due to faulty innervation and failure of certain internal secretions, or to fatigue or degeneration of the nerve fibres supplying the mucosa of the gastric and intestinal tract. A potential ulcer may then masquerade as a neurosis for a long time.

THE SIPPY METHOD.

Next, I went to Chicago to study the Sippy method of medical treatment of ulcer. His influence over the Chicago medical profession is apparently so great that during my stay of nearly two weeks I did not see one operation for ulcer listed on the surgical bulletin. I was pleasantly surprised to find that he does not lay claim to an ulcer cure, but terms his method ulcer management. I think credit is due to him for the very fact that he im-

pressed the medical profession that ulcers must be managed by strict régime, even as diabetes or Bright's disease was for a long time. He keeps his patients from two to four weeks in the hospital and plays with them to get the "dope," as one of his assistants expressed it to me, by a system of gastric aspirations, such as, 1, secretory; 2, therapeutic; 3, control; 4, motor aspiration. If patients are not benefited by alkalinization, he doubts the existence of an ulcer. If relief results from an enema, he suspects intestinal irritation as the cause of the stomach symptoms. The enema is also a diagnostic procedure with him. It is given a quart at a time at short intervals. If by gradual distention of the intestines pain is aroused, and when expelled pain disappears, then the condition might be intestinal. If no effect is produced by the enema, then the pain is gastric in origin.

Sippy has elaborated a complex system of dietetic treatment for gastric and intestinal conditions, especially ulcers. He starts his ulcer management by giving half of a glass of sweet cream and milk every two hours, and a powder of calcium carbonate or magnesium oxide in combination with sodium bicarbonate. The cream and the powders alternate. This is kept up for four days. On the fifth day one feeding is added and consists of an egg. The non-milk feedings are increased to six a day, and they comprise nonirritating and bland foods, rich in fat and protein. The increased fat in the stomach coats the gastric mucosa and thus lessens irritation. His belief is that the acid secretion is the cause of the pain.

Chronic diarrhea is often treated by diet, but I have noticed on Sippy's charts that opium is frequently used in this condition, so the formed stools cannot be due to his diet alone, which he asserts to be the case. In my opinion his claims are greatly exaggerated and when it comes to treating gastric ulcers, real or even suspected, he is playing with fire, since in thirty per cent. of these cases cancer develops. When it comes to treating women with gastric disturbance, the control of the hyperchlorhydria assumes an importance out of all proportion to its real significance as the cause of the condition, forgetting that it may be a concomitant symptom of gallstones or pelvic disease, which surgery alone can cure. Sippy's aversion to abdominal surgery has come at the psychological moment when surgery has begun to take stock of its afterresults and has found a great gap. What physician does not know of cases in which the patients have been operated upon without relief from the symptoms that led to operation? How many have been operated upon on x ray evidence alone and no lesion found? So there arose scepticism, in both laity and medical profession as to surgery's infallibility in this field. Sippy swung the pendulum to the other extreme, asserting that all ulcers should be treated medically. He is taking advantage of the present state of incredulity existing in the public and, to use the slang expression, "is cleaning up" in Chicago and the territory it drains. Furthermore, he does not believe in the newer advances in diagnostic procedure; he relegates even the x ray to a far removed seat; he uses it only for confirmative purposes, so when there

is nothing to confirm, he does not employ it; and yet his cases with epigastric pain pass for ulcer. The Chicago profession swallows his claims, which Philadelphia would not, I am sure.

BATTLE CREEK SANITARIUM.

From Chicago I went to the Battle Creek Sanitarium. This institution has my greatest respect. It stands between Rochester and Chicago, embodying the spirit of scientific investigation and research and thorough diagnosis and the belief in systematic, prolonged, dietetic, and physical treatment as necessities to a cure. My detailed observations I shall reserve for another occasion in a separate paper.

BOSTON CLINICS.

Boston clinics were my last destination, the two institutions that claimed my attention being the Massachusetts General Hospital and the Peter Bent Brigham Hospital. At the latter institution I found a gastrointestinal clinic conducted by Dr. McClure, who was treating his patients with psychotherapy. In Chicago, or elsewhere, this would have surprised me, but in Boston, the home of American religious mysticism, philosophy, psychology and the Emmanuel movement, such a clinic was a logical conclusion, and it interested me greatly. In a conversation with Dr. McClure I asked him the reason for such a clinic. He answered that he was doing it for experimental purposes. The gastrointestinal disturbances are so many and the correct diagnosis so difficult that he was endeavoring clinically to sift and separate them into distinct groups. Furthermore, he was trying to find out what part physical and nervous fatigue, as well as mental strain, played in the production of gastric symptoms. In so many cases patients had been operated upon for chronic appendicitis and even for ulcer with no relief, that he was desirous of finding the reason. "What if the nervous manifestation merely masks an organic lesion?" I asked him. "We do not lose sight of this possibility," he answered. "All that we do is to try to restore the patient's confidence in his own stomach by assuring him, after a careful physical examination, that there is nothing wrong and instruct him to eat plenty of nourishing food and at the same time to build up his morale. We believe we relieve him of his worry; if fatigued, we send him to a convalescent home; if he has financial and family friction, we send a social worker to smooth them out; if he has bad teeth, we urge him to have them attended to. In this way we succeed in building up the individual and curing him of gastric trouble." While this clinic has been conducted only six months, many patients have been restored to normal digestive activity.

In the general medical clinic I have seen many patients who gave as their chief complaint gastric symptoms of various degrees of severity, but after routine examination many were found suffering from tuberculosis, heart disease, or other nongastric conditions. A good gastroenterologist must indeed be a first class internist.

Dr. Shmookler used to maintain that the only gastroenterologist in existence was the surgeon; of course, he meant Dr. Deaver, who used to lay bare the living gastric pathology and upon the re-

moval of either an ulcer or a cholecystitis the symptoms would usually disappear, at least for the time. I hope that both of them think differently now. I know that Dr. Shmookler and Dr. Deaver, and others as well, have patients on their hands who have undergone several surgical cures and still complain of the original symptoms. So you see, some patient do not get well even after surgery has tried its sure method.

In the past, except in cases of acute ulcer, there was no rational medical treatment for the chronic types, because we had no rational conception of the underlying factors. Our first real knowledge indeed came from the surgeon, but the application by the thoughtful physician of this knowledge made the subject much clearer to us than it had been formerly. Moynihan's classification of the symptomology was a great help, but when carelessly applied met with many failures, so much so that surgeons were afraid to make a definite diagnosis and the era of explorations held sway. The x ray then came to their assistance and aided considerably in localizing the various gastric lesions actually seen by the radiographer. But when Holzkecht came out with his ulcer syndrome of hyperperistalsis, delayed motility meant ulcer, and the result was the same as that which followed the symptom complex of Moynihan.

CONCLUSIONS.

To sum up, from the different modes of thought regarding the etiology, psychology, pathology, diagnosis, and treatment of gastric disease, I formed one composite conception, for myself, of this most difficult branch of internal medicine. It consists of the most widely prevailing opinion, that as regards organic disease of the stomach and its adnexa, infection and intoxication play the most important rôle; that infection takes place as a result of infections in the mouth, respiratory tract, appendix and elsewhere, as primary foci; that the seat of intoxication is in stasis of the intestinal tract; that disturbances of the autonomic nervous system produce many gastric conditions, simulating organic disease; that the diagnosis should be based on a thorough study of the individual from the points of view outlined above, and of the intestinal tract, including detailed history, physical examination, x ray, and, last but not least, chemical examination of the secretions; that medical treatment properly applied, even in organic disease, is more efficient in early cases than surgery; that chronicity of ulcers is produced by lack of proper treatment in early stages; when properly managed by dietetic régime and frequently gauged by the fluoroscopic screen, the degree of improvement can be studied to better advantage. I believe that by following such a program many more cases can be cured medically, more cases brought to the surgeon much earlier, and thus will be diminished the incidence of cancer implantation, and the surgical complications arising from myocarditis, arteriosclerosis, and other conditions when operation is delayed too long. I believe that the newer type of gastroenterologist is to be commended for selecting the most difficult branch of medicine.

1527 NORTH FRANKLIN STREET.

Some Interesting Gastric Cases

By HENRY FLACK GRAHAM, M. D., F. A. C. S.,
Brooklyn, N. Y.

The argument over medical versus surgical treatment for gastric disorders is an ancient one. Frequently the problem is a hard one to solve correctly, but I think no one will dispute the fact that surgery alone could have given relief in the series of cases herewith reported. They illustrate a number of different conditions that have purposely been abbreviated as much as possible.

The operation used in most of the ulcer cases consisted of excision of the pylorus of the stomach and adjacent duodenum, closing up the end of the duodenum and uniting the open end of the stomach to the jejunum through an opening in the transverse mesocolon. The portion of jejunum used was about four inches from the duodenojejunal junction.

CARCINOMA OF THE STOMACH.

CASE I.—J. J., female, aged thirty-nine years. Six years ago, after the birth of a baby, she began to feel tired. For the past seven months she had regurgitated her food, often immediately after eating and sometimes at night. She had no pain except immediately before vomiting, and the vomiting relieved it. She had never vomited blood and had lost only four pounds in the last six years. Examination showed a thin, emaciated woman of sandy complexion. The teeth were very bad. The abdomen was thin and spastic and there was a sensation of mass in the epigastrium. The x ray showed considerable six hour residue. A diagnosis of pyloric obstruction was made and operation was performed at the Norwegian Hospital, August 23, 1920.

The entire pylorus was the sight of a hard nodular mass measuring two inches by five inches, infiltrating the wall of the stomach and gradually shading off into the normal stomach without any sharp border. The pylorus and adjacent two thirds of the stomach were resected. A posterior no loop anastomosis was made with the jejunum. The time of operation was two hours. Microscopical report on the section removed was carcinoma.

This patient vomited off and on for the entire day following operation. The interns were afraid to perform lavage and so let it go. After lavage, however, she vomited only once during her entire stay in the hospital and that was only three ounces. She received over two hundred ounces of fluid by rectum and under the skin. Our rule now is that a lavage shall be done after the first vomiting that occurs later than the anesthetic vomiting.

When seen two months later she weighed the same as before her operation, was feeling better daily, and gaining weight, she thought. On January 6, 1921, she was again seen. She had no pain and felt the best she had in ten years. She had three children and did all her own work, including washing. Three pieces of bread and a glass of milk filled the stomach. There was no sign of recurrence. On February 26, 1921, she had distention of the lower abdomen and a sense of mass in that region. The

epigastrium was soft, and no masses were present there. Evidently a recurrence was taking place at some distance from the site of operation.

CALLOUS ULCER OF THE STOMACH (PYLORUS).

CASE II.—S. H., female, aged thirty-seven years. This patient had had indigestion for twenty years with periodical attacks of pain in the epigastrium. She rarely vomited. The attacks would last for several weeks. The pain came on several hours (three or four) after eating and radiated through to the back. It was relieved by eating. She was always hungry. On January 13, 1920, she vomited a large amount of blood and was taken to a hospital in an ambulance. Since 1917 the suffering had increased, the attacks had become more frequent, and there had been more vomiting. She vomited food twenty-four hours after eating it.

Examination disclosed a hard, tender mass the size of a golf ball in the epigastrium. Her weight at that time was about seventy-nine pounds. She was much emaciated and had been in three other hospitals for treatment. Operation was performed at the Norwegian Hospital on June 23, 1920. A mass was found at the upper and posterior portion of the pylorus which was adherent to the abdominal wall anteriorly and to the pancreas posteriorly. The latter formed the bed of the ulcer. A pylorotomy was done and a portion of the head of the pancreas shaved off, or Pólya's operation, as in the previous case. Time of operation one hour and fifty minutes. The microscopical report gave no evidence of malignancy. She vomited three times during the first twenty-four hours, was lavaged once, and received about two hundred ounces of fluid by rectum and skin in the first few days.

After leaving the hospital she was troubled by cardiospasm. A stomach tube caught at the cardia but after a couple of minutes the spasm relaxed and allowed it to enter. On August 8th, seven weeks after operation, she had gained twenty-three pounds. A letter received January 8, 1921, said: "I was on seven machines and the average weight was 120 pounds. In March I was down to seventy-nine pounds. As regards pain I have none. I feel strong and very well indeed. It is a long, long time since I enjoyed such healthy days. I can do all my housework, washing, ironing, etc." Then follows a long description of the attacks of pylorospasm which still interfere, at times, with her eating.

I have ordered gradual dilatation with olivary esophageal bougies for this patient. She lives in Pennsylvania and it is difficult to carry on any proper line of treatment.

CARCINOMA IN THE EDGE OF A CALLOUS ULCER.

CASE III.—E. S., male, aged fifty-four. He had had pain in the chest for two years. It was not increased on inspiration and sometimes shifted to the back and right shoulder blade. Meat caused the pain two or three hours after eating and taking food

relieved it. He seldom vomited and the vomitus was clear sour water only, never blood. There had been three or four attacks in two years, each attack lasting two or three weeks. The present attack had lasted four weeks. This patient was given an ulcer diet and alkalis. He gained two pounds and a half

suture line had pulled completely out of the wall of the gut. The gastrojejunal opening now seemed rather too small. Diagnosis, peritonitis and lack of repair.

As an example of the tremendous amount of work entailed in the care of some of these cases: This patient received twelve hypodermoclyses of 335 ounces in all; 350 ounces of fluid were given by rectum, making a total fluid intake of 685 ounces. There were seventeen gastric lavages.

PERFORATED DUODENAL ULCER.

CASE IV.—J. C., male, aged twenty-two years; sheet metal worker. This patient had suffered in the past from acid eructations and indigestion. He once weighed 178 pounds. On August 6, 1918, he was operated upon for a perforated ulcer by Dr. Parker at St. Mary's Hospital. The perforation was closed but a gastroenterostomy was not done. Following this operation he was well for some months.

Six months previous to admission to the hospital he began to have a stabbing pain in the epigastrium which radiated up to the chest. It usually came two or three hours after eating and was relieved by eating. A severe attack at Christmas time lasted two or three weeks. He vomited nearly every day. Last March he vomited nearly a half pint of blood and also in May a smaller quantity. There were frequent white burning eructations. He was not constipated. He stopped work two months ago. X ray examination showed a dilated stomach. After entering the hospital the patient vomited three times before operation.

Operation was performed at the Norwegian Hospital on July 28, 1920; time one hour and forty minutes. A mass the size of a golf ball was found in the first part of the duodenum. Dense adhesions were all about. It was adherent to the liver and the pancreas and had ulcerated through into both

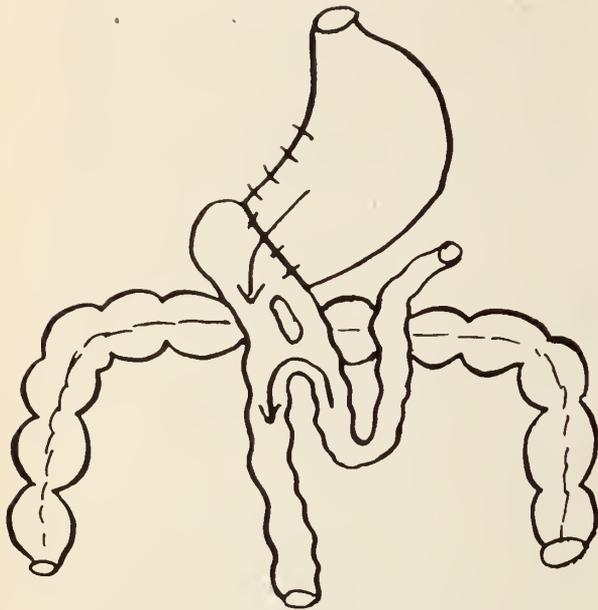


FIG. 1.—Anterior long loop operation with enteroenterostomy.

in a month and at times had no pain, but later became worse again and was sent to the Methodist Episcopal Hospital. An x ray examination showed bismuth in the stomach twenty-four hours after the meal.

Operation was performed on December 23, 1920, time consumed one hour and forty-five minutes. The posterior wall of the stomach and the duodenum were found very adherent to the pancreas. There was a hard ulcer the size of a half dollar on the posterior wall near the lesser curvature. As the stomach was loosened up behind and separated from the pancreas it left a round hole in the stomach wall and a large round ulcer base in the pancreas. (Microscopical report of the edge of this ulcer was carcinoma.) The ulcer was cauterized and the pyloric half of the stomach resected. An anterior long loop anastomosis with the jejunum was made and a jejunojejunosomy with a Murphy button.

There was considerable vomiting following operation and on the fifth day it seemed advisable to explore again. The button was loose and was removed and the anastomosis, which showed practically no sign of union, was sutured with two layers of suture material. The gastroenterostomy seemed freely patent and the suture line there was intact. The patient was given powdered charcoal which appeared in the stools. Lavage reduced the six hour gastric retention from twenty ounces to six ounces. Milk was given through the stomach tube and seemingly passed down through the intestines. Death, however, ensued.

At autopsy it was found that practically no repair had taken place in the closed end of the duodenum or at either anastomosis; both were easily pulled apart. There was some peritonitis where the last

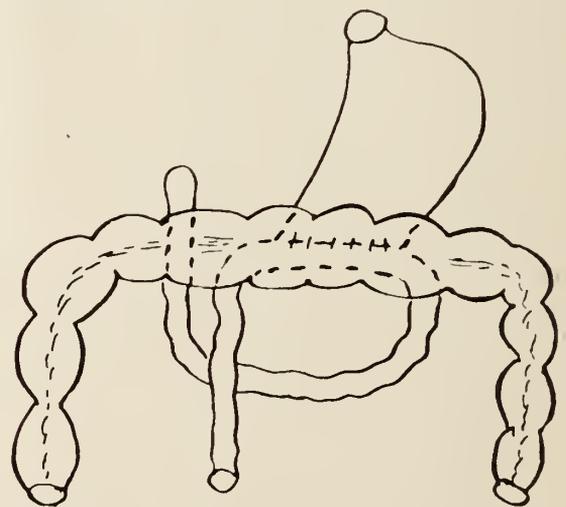


FIG. 2.—Posterior no loop operation.

leaving a crater. A pylorotomy, with a posterior no loop anastomosis to the jejunum, was done. The pancreas was sutured. Convalescence was very stormy. The patient returned from the operating room with a pulse of 160. Lavage on the second day was clear. On the succeeding four days there

were eight more lavages, then there was an intermission. On the ninth day bile appeared in the wound and a diagnosis of duodenal fistula was made. Pancreatic juice was present and excoriated the skin for an area of six inches in all directions. The petrolatum gauze used with Dakin's solution gave the most relief from this.

On the eleventh day he vomited again and was lavaged twice. On the thirteenth day he expectorated bright red blood, his respirations were labored, he was irrational and weak. By the fourteenth day the pulse was thready and his hands were cold and clammy. The relatives were notified and death seemed imminent. A surgeon, who saw him at this time as he was walking through the ward, remarked later, "I wouldn't have given you ten cents for him." He had received fourteen lavages. Much saline, glucose and sodium bicarbonate had been given by rectum and by many hypodermoclyses. We felt for these fourteen days as though we were sitting on a red hot griddle. Now the tide turned and the remainder of his stay in the hospital, thirty-eight days in all, was uneventful.

On October 4th I saw him and he was eating everything except meat and soups. His bowels moved regularly once or twice a day. There was no pain, and very little gas. On January 10, 1921, his weight was 151 pounds. He looked fine and healthy, color was splendid. He had gained twenty-five pounds since leaving the hospital, and was eating a little meat. Bowels moved once daily. He had no pain at all and no acid eructations. He was eating regular meals. The abdominal scar was firm; there was no ventral hernia.

DUODENAL ABSCESS.

CASE V.—O. E. H., aged thirty-two years, machinist. He had had attacks of indigestion from the age of twelve years. During an acute attack in 1909 he was taken to a hospital and his appendix was removed, without improvement of the condition. He had had severe headaches and vomiting spells at intervals of two or three weeks. On a trip to Norway in 1913 he noticed blood in his stool.

Operation was advised at that time and refused. He had been careful of his diet ever since.

In the spring of 1920 he began to lose weight and look paler, and there was a sharp expression in the eyes. On August 3, 1920, after eating herring and tomato which had been in the ice box three days, he went into convulsions which lasted two hours (perforation?). There remained a soreness in the right upper abdomen so painful that the patient could not move in bed. Five days later he entered the Norwegian Hospital. Some tenderness and rigidity were present over the duodenal region. There was a high differential and leucocyte count.

Operation was performed on August 18, 1920. An abscess containing four ounces of thick yellow pus was found occupying the region bounded by the pylorus, duodenum and gallbladder. The abscess was drained and the patient made a good recovery. Later reports indicated that he might possibly be cured although he had had one attack of indigestion from an indiscretion in diet. I would have done a gastroenterostomy in this case but it seemed inadvisable with pus present.

In conclusion let me make a plea for the surgeon who handles these cases. This is glorified plumbing, the hardest kind of surgery. It requires the greatest skill at the table and the utmost persistence and judgment afterward. And even if the work is all done properly there are still other factors to be reckoned with that may cause a fatal outcome. I know that the results in many of these cases are far from perfect but many a human machine has been taken from the junk heap and made to run again once more when there seemed to be no possibility of it. We cannot "restore again the years that the locusts have eaten," as the *Bible* puts it, nor can we make them all strong, healthy and free from symptoms, but we can get them back to work and useful members of society once more. Only one word in regard to aftercare. Frequent small meals of soft material; no meat or meat soups or condiments, and keep them away from work and worry as long as possible.

A Report of Some Abdominal Cases*

By VERTNER KENERSON, M. D.,
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About six years ago one of two young men, who were out at the Buffalo city line practising with a rifle, had the misfortune to shoot the other in the abdomen, causing a penetrating wound of the small intestines, the bullet puncturing the gut seven times and passing out of the abdomen at the opposite side from that at which it entered. I was on service at the Erie County Hospital and was summoned at once. The young man was in a state of collapse, was bathed in cold perspiration, with weak pulse, and in poor condition generally. The intestines were full to overflowing with partly digested food.

I took with me two books of a dozen each of Lem-

bert silk sutures, which were already sterilized, and had them resterilized at the hospital after I arrived there. These books are simply pieces of cotton cloth, on which have been arranged twelve fine cambric needles, threaded with fine white surgical silk, and drawn into the cloth so that they will be readily available, and drawn out by simply taking hold of the needle and drawing, so that they will not be snarled when withdrawn. The silk in each needle is tied to the eye of the needle so that as little inconvenience as possible will result during the operation. These needles are so fine that it takes considerable time and patience to thread them, and there must be a supply sufficient for any given case al-

*Read before the Buffalo Medical Society, February, 1921.

ways ready, and in this case two books were taken and resterilized by boiling with the instruments at the hospital after my arrival there.

No attempt was made to evacuate either the bowel or the stomach. The exterior of the abdomen was cleaned as carefully as possible, shaved, and scrubbed with green soap, turpentine, and alcohol. An incision was started at the point of entrance of the bullet, and carried down to the peritoneal cavity. This at first was made about three inches along the line that the bullet was supposed to take, indicated by its direction from entrance to exit. When the peritoneal cavity was opened all extraneous matter was sponged out, the immediate surrounding viscera were sponged off, and the intestines examined without unnecessary handling.

Immediately below the bullet hole in the body wall I found the first hole in the small intestine, and this was pulled out ever so gently, walled off by laparotomy sponges, and repaired. Without trimming the ragged hole in the least, but simply inverting the edges into the wound, a double row of sutures were used to close each one in turn. The first row of Lembert sutures were placed close to the wound, passing the fine straight needle through the serous and muscular coats, but being careful not to penetrate the mucous coat.

The second reinforcing row of sutures was placed parallel to the first row but a little removed so that they were folded into the first row. No attempt was made to roughen the serous surface to make the stitches hold better, but the serous surfaces were coaptated as carefully as possible, and a double row of sutures used to make a tight seal. This turning in of the gut, using the second row to seal the first, was applied so that the pucker in the gut came in the length and not the circumference of the gut. In only one instance was there a hole on directly opposite sides of the same inch in length of the gut, and there was so much puckering that I thought there might be some loss of peristalsis and consequent occlusion. None developed, however, only some sluggishness, which was to be expected, especially after the administration of opiates. The little bleeding spots on the serous surface of the gut were simply turned in, if at or near the bullet hole, or simply tied in with a separate Lembert tie, if at a distance; no ties of catgut were used. There was little outside bleeding, and when Lembert ties were necessary, great care was used not to penetrate the mucous coat, as the silk suture is left *in situ*, and would act as a constant drain if infection followed from the site of the suture to the mucous canal.

After each bullet hole had been closed with this double row of Lembert sutures, as described, the surrounding tissues were sponged with normal sterile salt solutions, some being poured on the surrounding abdominal tissues, and the uninjured gut was sponged off as carefully as the circumstances would permit. The gut was then examined inch by inch and as soon as the next penetrating wound was encountered, steps were immediately taken to wall off that section of gut so that as little contamination as possible would be spread. This second hole was then repaired in the same manner as

the first, namely, with one row of sutures close to the bullet hole and a second reinforcing the first. In its turn the immediate surroundings were cleansed, the packing removed, and the wound left as dry as feasible and the exploration continued.

I did not make any attempt at first to determine how many holes there were, but simply repaired each one as fast as it was found. There was little bleeding except from the individual bullet wounds in the gut, and after seven had been repaired, exploration was made in the back of the abdomen and pelvis to be sure that all the blood had been removed. There did not seem to be much soiling of the serous coat, either with the intestinal contents or with blood, except on the tissues immediately surrounding the bullet holes. When the final toilet of the peritoneum had been made, the exploratory incision made in the abdominal wall, which had, *pro re nata*, been lengthened to seven inches, was closed with silkworm gut sutures and a small drain of iodoform gauze left in the end of the wound first made. This wick of gauze remained in place until the bowels had been moved twice, but there was no dressing and no manipulation of the wound with irrigation that disturbed the wound, until that wick of gauze was taken out. The patient's bowels were tied up with opium for two days and he was given hypodermics of morphine for pain, but the bowels moved on the third day and there was no vomiting after the second day. All stitches in the abdominal wall were out at the end of a week.

Of course the fine Lembert sutures are usually left *in situ* and are eventually absorbed. They usually cause no difficulty, unless they have been accidentally carried too deep and involve the lumen of the gut, and in that case sometimes cause local infection, which if insignificant is cared for by the system, but if considerable the infection may become general and a general peritonitis follow. In the case reported no untoward symptoms arose and the young man went home at the end of three weeks. Today I called up his father, who reported that his son had had no sickness or accident since that time, weighed about 160 pounds, and was the picture of health and strength.

The second case was that of a woman about fifty years of age, who had suffered for a number of years from a long and increasingly complicated rectal disorder. She had passed through many cycles of advice and discouragement and at the end of it all was no better. She came to me about three years ago, giving the history of increasingly difficult defecation with stools gradually increasing in size. Local examination showed no induration of the abdomen at any point, comparatively little tenderness, no loss of flesh, and no cachectic pallor. The patient was fairly well nourished, ate and slept well, but was somewhat neurotic and had a sense of fullness in the abdomen at all times. Rectal examination did not show any bulging of the rectum or anus, no enlargement of glands, no history of venereal disease. She was married but had no children; husband healthy and robust, with no history of venereal disease. Five members of her own immediate family had died of tuberculosis and one sister at that time was in Colorado under observa-

tion for suspected tuberculosis. Dr. Leonard Retz, under my direction, made a series of x ray plates, with different times of advancement of the intestinal contents. These showed nothing that could be interpreted as growths, but simply emptying viscera. The stomach and small intestines were normal in function, no gallstones, but the descending colon showed a tortuous, very much diminished lumen for about four inches, with an entirely patent bulging gut at the lower end of this tortuous canal. The stools, that had with great difficulty been expelled before the operation, were soft, varying from the diameter of an ordinary lead pencil to that of the lead of the pencil.

The clinical history was such as to lead to the inevitable conclusion that there was a malignant growth, but the personal history of the patient was at entire variance with that conclusion. What occlusion there was of the colon was in the descending arm and did not involve the last four inches. Reasoning by afterresults, this condition must have been caused by some low grade tuberculous ulceration, long since quiescent but continually more potent, until something had to be done.

The full details were explained to the patient and her husband, with all the dangers and the possibilities. With the assistance of Dr. Rasbach, Dr. Leonard and a competent nurse I undertook the operation in a private house. I took with me several books of Lembert sutures, some Murphy buttons, surgical dressings, and other operating paraphernalia from my own office. After careful pre-operative and surgical preparation, which included no food for twenty-four hours, a median incision was made and extended until a complete inspection of the colon was possible. A part of the transverse colon was then selected and drawn into the wound, packed about with sterile compresses, and the colon opened on the side opposite the mesenteric attachment and the male portion of the Murphy button was inserted and held in place by means of a hemostatic. A pursestring suture of fine white silk, but not so fine as the Lembert suture silk, was passed around the protruding end of the button, in the serous and muscular coats, but not impinging on the mucous coat. This was held taut. Then a similar opening was made in the part of the descending colon below the cicatrix, in the bulbous portion, the female end of the button inserted, a pursestring suture passed about this opening, and the end of the button was held by Dr. Rasbach by grasping that portion of the button through the gut wall. Then the pursestring suture was drawn tightly around this latter portion, narrowing the opening until the serous coverings of the gut from both sides of the Murphy button were brought into apposition when the button was snapped together. When the two ends of the button were snapped together and before the serous surfaces were too tightly clamped, a careful examination was made to be sure that there was no leakage, then the two parts of the Murphy button were clamped tightly, but not enough to cause strangulation. A single row of Lembert sutures were inserted in the serous surface about one quarter of an inch apart connecting the serous surfaces on the one side of the button

with a serous surface on the other side. These were accurately tied, and the serous coats were cleansed from any possible contamination by the bowel content, and the whole mass was returned to the abdominal cavity. I hope that I have made this clear.

At the time of the operation there was almost entire occlusion of the descending colon, probably from cicatricial contraction of the lumen of the gut from, to me, causes unknown, but supposed by me to have been tuberculous. There was no specific history and none could be elicited and none suspected. The occlusion was relieved by short circuiting the colon from a place well above the stricture to a place about two inches below and this was done by inserting a Murphy button. I realized the difficulties of this short circuiting and told the family that that piece of gut might later fill up and cause pain, perhaps also some necrosis, in case it did not empty. A realization of this possibility did not deter me from leaving it, but a more complete operation would have been to short circuit the gut and then to excise the stricture and the portion above it that was left out of the current, but I thought best not to prolong the operation and hazard the patient's recovery by prolonging the shock. She was given an anodyne and put to bed with the foot of the bed elevated, and food and water were withheld for twelve hours. The dressing was a simple dry dressing on the surface, with silkworm gut sutures and a simple iodoform gauze drain extending down to the button, which was left *in situ* superficially and that gauze drain was not removed until her bowels had moved. The first movement showed the characteristic movements with colon operations, with some blood which did not reappear after the button sloughed away at the end of seven days. She was kept on a liquid diet for two weeks and soft food for a month, but was given no anodyne after the first three days. There was no elevation of temperature when the button came away.

The patient is alive at the present writing and as well and healthy as women of her age are expected to be. There has been no cachexia, no enlarged glands, no stoppage of the bowel, no induration, and there has been no aftertreatment with tuberculosis antitoxin or has there been any specific treatment with mercury or salvarsan. I go into these details as the explanation of the stricture was, and still is, unsatisfactory, but the relief has lasted for three years and I am sure if there was any taint of malignancy there would have been evidences of return long before this. She was a music teacher and the wife of the mayor in a city of a neighboring state. Her weight before the operation was 132 pounds and a few days ago when weighed in my office her weight was 148 pounds. She suffers from periodical attacks of high blood pressure, but has practically no abdominal symptoms. She has one or more bowel movements every day, normal in size and consistency, with a simple hepatic stimulant. She is never depressed nor melancholic. I do not presume to state what was the real cause of the stricture, but feel that malignancy can be ruled out. The unused circuit in the colon still remains, but with little or no untoward result.

181 ALLEN STREET.

Spontaneous Pneumoperitoneum Demonstrated by the X Ray in Acute Gastrointestinal Perforations*

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In most acute perforations of the gastrointestinal tract the clinical picture is pathognomonic, but occasionally the symptoms and physical signs are so atypical that a diagnosis is difficult. In such a situation the possibility of demonstrating with the fluoroscope the presence of free air in the peritoneal cavity should be considered, as is illustrated by the following case report:

CASE.—The patient was a male, aged fifty, of Turkish nationality. He spoke very little English and the only information obtainable on admission was the occurrence of severe pain some twelve hours before, with one attack of vomiting, and a marked subsidence of symptoms since. The house surgeon found generalized abdominal rigidity and tenderness and at first considered it an acute abdomen, but after the patient was made comfortable in bed, the rigidity diminished and he improved so rapidly that no attending surgeon was called.

The patient was seen on the attending surgeon's rounds in the afternoon, sixteen hours after the onset of the attack. He was smiling, sat up in bed easily, and there was no complaint of pain. He did not appear acutely ill. His temperature was 100.4°, respiration 24, pulse 96, and excellent in quality. The blood count was 12,000 total, polymorphonuclears 88 per cent. The urine showed a few granular casts and an occasional white blood corpuscle.

Physical examination at this time showed the patient's abdomen to be flat and soft, with only a slight suggestion of muscular spasm in the epigastrium, which was thought to be more or less voluntary, as it was difficult for the patient to understand what we wished him to do. There was only slight tenderness in the upper abdomen, even on considerable pressure. No obliteration of liver dullness on percussion could be demonstrated.

In view of the history and rigidity observed by the house surgeon on admission, a perforation of the stomach or the duodenum was naturally considered, but the clinical picture was so unlike that of a ruptured ulcer of sixteen hours' duration that we hardly felt this could be the actual pathological condition. We had almost decided to wait for further developments when Dr. Edwin Beer fortunately suggested a fluoroscopic examination and the diagnosis in a very puzzling case was made absurdly easy by observing the air line between the liver and the diaphragm.

On operating, an upper right rectus incision was made, but before opening the peritoneum saline was poured into the wound so that the air in the abdominal cavity was seen to bubble through the water when the peritoneum was incised. There was a small amount of stomach contents between the liver

and the duodenum, and a moderate degree of localized peritoneal irritation. The perforation was a small one near the pylorus on the anterior surface of the stomach and was plugged by a bit of omental fat so that nothing escaped until this was wiped loose. This sealing off of the perforation accounted, of course, for the absence of progressive symptoms. The perforation was closed with three purse-string sutures, reinforced by a piece of omental fat. A posterior gastroenterostomy was performed, the peritoneal toilet completed, and the wound closed in the usual manner with a cigarette drain through the peritoneum. The patient made an uneventful recovery except for a slight infection in the upper angle of the wound and when last heard from, five months after the operation, was in good condition. A search of the literature dealing with this subject reveals only a few reports in which this aid to diagnosis has been utilized.

In 1916 Robert Lenk (1), a military surgeon working on the Isonzo section of the Eastern front, reported the x ray findings in fresh gunshot injuries of the abdomen. He particularly emphasized those cases in which the x ray showed the presence of air between the liver and diaphragm, establishing the presence of a gastrointestinal perforation. He suggested that this method would be of value in civil practice in the diagnosis of perforated ulcer.

Dr. Walton Martin (2) in 1917 reported a case presenting conflicting abdominal and pulmonary signs in which an x ray photograph had been taken with the idea of demonstrating pneumonia. Dr. LeWald, the röntgenologist, observed an area of lessened density between the liver and diaphragm and suggested that there was free air in the peritoneal cavity. On the strength of this Dr. Martin urged an operation, but it was refused by the medical attendant. Subsequently the patient manifested a fluctuating mass in the right flank from which pus was evacuated. Dr. Martin regarded the primary condition as probably a subacute duodenal perforation.

The difficulty of diagnosing perforations in typhoid fever is frequently experienced, so the following case report published in 1919 by Dr. Walter E. Danby (3) is of unusual interest.

The patient had been under observation at Johns Hopkins Hospital for two weeks and the case was regarded as probably typhoid, although the laboratory findings were negative. Upon the development of obscure abdominal symptoms a possible perforation was considered. Some of the consultants suggested the diagnosis of acute miliary tuberculosis with peritoneal involvement. For this reason an x ray of the chest was taken. This fortunately showed the upper abdomen and demonstrated free air between the liver and the diaphragm. The op-

*Reported from the Fourth Surgical Division of Bellevue Hospital; case report presented before the Surgical Section of the New York Academy of Medicine, May 6, 1921.

eration disclosed a large typhoid ulcer perforation, which was sealed over by omental adhesions.

In attempting to use this means of diagnosis, it should be remembered that the air will rise to that part of the abdomen which is uppermost, whether the hypochondrium, the flank, or the pelvis. It is also possible that the air might be held by adhesions in the region of the perforation. Before x raying the patient, therefore, he should be placed in such a position that the air will rise to the part of the abdominal cavity which is easiest to expose, and the plates should cover every area suspected of being

the site of the perforation in case the air should be encapsulated by surrounding adhesions.

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- 48 WEST FIFTY-FIRST STREET.

The Diagnosis and Treatment of Gallbladder Disease*

By ABRAHAM O. WILENSKY, M. D., F. A. C. S.,
New York.

Disease of the gallbladder and biliary apparatus—cholecystitis, choledochitis, cholangitis and cholelithiasis—is most commonly an affection of middle age, occurring with special frequency in women and closely associated with the incidence of pregnancy. There is, however, no restriction of this disease to the middle periods of life and many cases probably originate at a very early age, under fifteen years, and persist with no or only indefinite symptoms until later.

Abundant surgical experience teaches that the various pathological pictures which one can encounter in the manifestations of this disease are essentially the following:

1. Gallbladders of a practically normal histological structure. There may be many or few stones, or a single fairly large stone is present, which, becoming encysted in the neck of the gallbladder or cystic duct, gives rise to hydrops.

2. Large distended gallbladders, showing histologically more or less atrophy and containing many or few stones. Stones may be present in any of the ducts.

3. Gallbladders in which infection has taken place. These include empyemata of the gallbladder (or infected hydrops), acute and chronic cholecystitis with or without productive changes in the gallbladder wall, all of these with or without stones. Pericholecystitic abscesses with and without perforation of the gallbladder wall may complicate the picture. Stones may be present in any of the extrahepatic or intrahepatic ducts and may or may not be associated with a cholangitis.

4. The end results of group 3. The gallbladder may be larger or smaller than normal, may be much thickened or much thinned, and is usually much deformed. In some of the cases the gallbladder is so shrunken, that, when no stones are present, a natural cure may be approximated. The amount of pericholecystitis may be so extreme as to be capable of producing symptoms of its own accord.

5. Any of these types associated with a swelling of the head or head and body of the pancreas. The

clinical picture may not be distinctive, or it is marked by the characteristics of a fulminating acute hemorrhagic pancreatitis.

In any of these cases the sequence of events in the development of the finished pathological and clinical picture varies with the nature of the inciting agent. In some of the cases the disease is initiated by a frank infection; in these the infection may begin as a catarrhal cholecystitis, or the first manifestation may be that of an acute empyema of the gallbladder. In others the etiological cause seems to be a disturbance of the cholesterolin metabolism. Most of these have their beginning in pregnancy or in the postpartum period, and the symptoms are directly due to the stones acting as foreign bodies. In much the larger number of cases the mechanism includes both infection and disturbances of metabolism acting alternately or together and with various degrees of severity. Depending upon the factor which is uppermost at the time the patient is seen, the stage of the process, and the presence or absence of complicating factors which now become numerous, the pathological picture shows wide variations. The important point to remember is that all of the pictures described in this communication are but stages of one another and the ultimate development is only a question of time.

The advance of the pathological process is, however, unfortunately associated with complicating changes in neighboring viscera. Graham has shown that all cases of cholecystitis are accompanied by inflammatory changes in the liver parenchyma itself. These vary from an infiltration with small round cells to necrosis with fatty infiltration, and in chronic cases there are changes suggestive of cirrhosis of the liver in its early stages. There has been some experimental work done (Ogata, Rous and Larrimore) to show that in human pathology these liver changes probably result from a combination of infection and biliary stasis. In intrahepatic cholelithiasis a form of biliary cirrhosis is fairly common.

There is considerable clinical evidence to show that advanced disease of the biliary system is associated with changes in the pancreas; these latter are of an infectious origin and are due to the spread

*From Mount Sinai Hospital. Read at a meeting of the Harlem Medical Society, February, 1921.

of bacterial toxins along the lymphatics into the substance of the pancreatic gland. Clinically the anatomical changes may not be productive of immediate symptoms—except, perhaps, those of an acute hemorrhagic pancreatitis—but ultimately these give evidence of their presence in one way or another.

One should not forget that acute infections of the gallbladder can produce perforation and either a general peritonitis, which is rather rare, or a localized pericholecystitic abscess, which is rather common; and that chronic infective processes associated with stones can produce chronic penetrations and perforations into adjoining viscera and produce such a stubborn pathological process as to result finally in a fatality. Under the latter conditions a cholangitis develops and plays a prominent part.

Of all the varied pathological conditions to which disease of the biliary tract may lead, and of all of the complications which may occur, the most to be feared is a true infection of the intrahepatic bile passages. True infectious cholangitis is a most serious lesion, not rarely resulting in a fatal issue, marked with chills and fever and other signs of a high grade of intoxication and frequently running a rapid course; in its milder forms it leads to connective tissue changes in the liver parenchyma and commonly a precipitation of stones in the intrahepatic biliary passages is part of the pathological picture.

In order to obviate these unnecessary complications and sequelae of gallbladder disease it is essential that the condition be correctly diagnosed at a comparatively early stage of its development. Unfortunately, however, there is not available at the present writing any method of precision for this purpose except in a very small minority of the cases. One must, therefore, in the greatest number of the cases, rely on the general manifestations of the disease and on those elicitable indirect data which, by their presence, give presumptive evidence of the presence of diseased processes in some part of the biliary system.

Of all of these the history is most important. These include 1, cases with definite attacks of gallbladder colic; 2, the cases with indefinite symptoms referred to the right hypochondrium, or to the stomach; and 3, the cases with the clinical picture of an acute intraabdominal infection localized in the right upper quadrant of the abdomen. These various clinical pictures differ essentially in the presence or absence of definite attacks of biliary colic. When these attacks are present, either observed by the physician or so well described by the patient as to correspond to our notions of what these should be, they furnish indubitable and the most important single evidence of the presence of some form of disease in the gallbladder or bile ducts.

The physical examination yields the second best data useful in the making of the diagnosis. The possible data may be, 1, entirely negative; 2, partially positive; or 3, entirely positive. The definitive data include the presence of a palpable mass, the local and general signs of peritoneal inflammation or irritation, and the presence of jaundice. When the evidence is entirely positive it is always of so decisive a nature as to make an immediate diagnosis

possible; this is most likely to happen in the acute inflammatory cases. In the chronic cases the physical examination usually yields negative data.

In the absence of definite criteria, either in the history or in the physical examination, the diagnosis of gallbladder disease is always a presumptive one except in those fortunate instances in which the x ray is capable of yielding positive evidence of the presence of calculi. These positive evidences are, however, neither the rule nor very common, so that in many of the cases of gallbladder disease operation frequently assumes the characteristics of an abdominal exploration.

It is rather premature, at the present writing, to formulate the final opinion of the value of the intraduodenal use of magnesium sulphate (Lyon's test) in the diagnosis of gallbladder conditions. The method needs much more extensive experiment and use and the procedure ought to be further simplified in order to make it the basis for reliable work by the general practitioner. The method, however, holds forth promise.

Medical treatment of gallbladder disease can at most be only palliative. To those of us who see these conditions demonstrated day after day on the operating table, from the very simplest of diseased processes to the most complex, and who realize the seriousness of the late complications, it is inconceivable that medical therapy can ever accomplish a permanent cure. And if one realizes these facts it is apparent that the only efficacious treatment is that yielded by surgery. Those of us who see the late results of neglected gallbladder disease are impressed with the great necessity of operating upon these patients at the earliest opportunity in order to minimize the risk of operating, which is much greater in the late cases, and in order to obviate all the secondary changes in the liver and pancreas.

One should not be led astray by the enthusiasm of Lyon as regards the therapeutic possibilities of his method. With the presence of stones, or the results of infection, the method at most can be only palliative, or perhaps adjuvant to the very necessary surgery. Any condition of a nature more complicated than the simplest is practically entirely beyond the reach of the method for the procurement of permanent results.

The mortality in gallbladder operations is dependent upon the presence and number of complications, and upon the presence of associated conditions. The presence of an associated cholangitis is a most serious matter. With common duct obstructions the mortality may run as high as fifty per cent. In uncomplicated cases, the presence of disease in the lungs, heart, or kidney plays a most important rôle in the mortality statistics. All of these facts have extremely important bearings, inasmuch as at an early stage of the primary disease in the gallbladder these either do not exist or have not been aggravated to such an extent as to increase the risks of operative intervention. With the removal of these handicaps—which can only be accomplished by early surgical intervention—the mortality of operation upon the gallbladder should not be more than two or three per cent.

1200 MADISON AVENUE.

The Nonsurgical Drainage of the Gallbladder as an Aid in the X Ray Diagnosis of Gallstone Disease

By SAMUEL WEISS, M. D., F. A. C. P.,
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The röntgen diagnosis of gallstones within the past few years has almost been accomplished by the use of new and powerful apparatus and improved technic. Carl Beck, in 1899, demonstrated a röntgenogram of biliary and hepatic calculi. Since then frequent attempts have been made by men to show gallstones with more or less success. Pfahler, Case, Cole, and George are among those who have been enthusiastic in their endeavor to demonstrate the feasibility of the röntgen ray method of detecting calculi. Pfahler believes that about fifty per cent. of stones are demonstrable. Case is of the opinion that when gallstones are present he can demonstrate forty or fifty per cent. Cole regards catharsis and fasting as an essential preliminary to plating. George and Leonard lay claim to eighty-five to ninety per cent. success.

The composition, size, number, and situation of the gallstones, their enveloping medium, the amount of obstruction by liver tissue, the intervening adipose tissue, the preparation of the patient, and the technic, all are factors affecting the demonstrability of stones. Pure cholesterin stones have slight density and are more difficult to show. The mixed type of stones, containing cholesterin, bilirubin, and calcium salts, are most common and their density is proportionate to the amount of lime present. Stones composed wholly of lime salts cast the deepest shadows. Large stones, even though poor in calcium, and numerous small stones massed together are demonstrable. Bile is a poor conductor of the rays, and the presence of stones in a bile filled and distended gallbladder do not give satisfactory shadows. The density of the liver tissue, by obscuring the shadows of the stones, is a serious obstacle to their detection. A corpulent individual is not a satisfactory patient for röntgenography of the gallbladder.

In 1917, the late Dr. Meltzer, writing in the *American Journal of the Medical Sciences*, demonstrated the action of a twenty-five per cent. magnesium sulphate solution when applied to the mucous membrane of the duodenum. This application caused a complete local relaxation of the intestinal wall. It did not exert such an effect when the salt was administered by the mouth, that is, when it had to pass through the stomach before it reached the intestine. He further stated that the application of a twenty-five per cent. solution of magnesium sulphate by means of the duodenal tube may relax the sphincter of the common duct and permit the ejection of bile, and perhaps, even permit the removal of a calculus of moderate size wedged in the duct in front of the papilla of Vater.

Immediately after the publication of Meltzer's paper, Lyon, of Philadelphia, demonstrated that the local use of magnesium sulphate in various strengths in the duodenum of human beings would promptly deliver bile through the duodenal tube in varying

quantities and of various quality. It would do this when the duodenum was previously bile free, indicating that the magnesium sulphate had relaxed the sphincter action of Oddi's muscle. Further than this it was noticeable that the character of the bile recovered by means of the duodenal tube underwent certain definite changes in color and viscosity, first a light lemon to golden yellow, then a deeper, richer, more syrupy golden yellow, and finally to a uniformly light lemon yellow, thinner and less syrupy than either of the first two; and that this sequence occurred in all normal cases.

Two years later Rehffuss, of Philadelphia, published a paper on the Medical Treatment of Biliary Affections, in which he described the method of obtaining bile and treating the biliary apparatus through the duodenal tube. Since the publication of Meltzer's, Lyon's and Rehffuss's papers I have made several hundred observations of the practicability of a nonsurgical method of biliary drainage. With certain exceptions, it is possible to drain the gallbladder wholly or partially of its fluid contents, to drain the bile ducts, and to obtain bile freshly secreted from the liver cells. Furthermore, it is possible to segregate the bile from these several sources by collecting it in individual bottles for chemical, microscopical, and bacteriological examinations that give us a direct method of differential diagnosis in diseases of the biliary system.

The röntgen examination consists of direct examination of the gallbladder region to determine whether visible shadows can be detected; whether the gallbladder itself contains inspissated bile, or its walls are thickened or calcified. Indirect signs obtained in the course of a routine examination of the digestive tract (Carman) are: 1. Gastric spasm; 2, six hour residue in the stomach or duodenum; 3, fixation of the pyloric end of the stomach, duodenum or hepatic flexure; 4, drawing of the stomach to the right by adhesions, or displacement to the left by an inflammatory mass about the gallbladder; 5, increased gastric peristalsis; 6, demonstration of Riedel's lobe of the liver; 7, localization of tender point over the gallbladder area; 8, demonstration of an organically normal stomach and duodenum, thus excluding them as probable causes of the symptoms. The most common lesions giving rise to symptoms which are often confusing are gastric ulcer, duodenal ulcer, cholecystitis and appendicitis. In the absence of peptic ulcer, the gallbladder and appendix must be considered.

In examining the plates taken of patients suspected of having gallstones, my attention was directed to the greater number of shadows visible in the gallbladder region of some patients than in others where the same röntgen technic was employed. After careful investigation I found that drainage of the gallbladder through the duodenal tube after the introduction of magnesium sulphate,

permitted better demonstration of the calculi with the rays. The accidental discovery caused me to "sit up and take notice," using the vernacular; that is, I experimented with the same individual before and after aspirating bile through the duodenal tube and the results were phenomenal. Where in one case there were none or barely perceptible shadows in the gallbladder region before duodenal drainage, they were visible after aspiration. I did not permit my enthusiasm to wane but kept up my investigations and, where possible, followed the patient to the operating table and found that the diagnosis was corroborated.

For the benefit of the uninitiated it will not be amiss to mention the method of obtaining the bile through the duodenal tube. To make possible an accurate diagnosis of the duodenal biliary zone it is necessary that we adopt means to prevent cytological and bacterial contaminations from the teeth, tonsils, respiratory tract, and stomach from confusing us in our interpretations of duodenal and biliary materials. To prevent this as far as possible I have adopted the method advocated by Rehlfuss and Lyon. The patient is instructed to purge himself the night before with castor oil and in case the results are not satisfactory to use an enema in the morning. He is also instructed to fast prior to the examination. When the patient is not to be x rayed on the same day I omit the castor oil and enema. The mouth is rinsed with some antiseptic solution, a sterile duodenal tube is passed into the stomach, and the contents of the fasting stomach aspirated. The stomach is then thoroughly rinsed and the patient is given a glass of sterile water to drink while slowly swallowing the tube to the duodenal point. In some cases I place the patient on

his right side, while in other cases this is unnecessary as the tube slips into the duodenum readily. The time required for the entrance of the tip into the duodenum varies in each individual, and also depends upon the tube used. The bile is readily recognized by its appearance, and it will be noticed that the flow is intermittent. Failing to obtain bile after a certain reasonable time, or if the flow is not sufficient, the duodenum is douched with about fifty to seventy-five c.c. of a twenty-five to thirty-three per cent. solution of magnesium sulphate. Where the gallbladder is found to be atonic it is necessary to restimulate its contraction by douching again with half the amount of magnesium sulphate.

Failure to obtain bile may point to the following conditions:

1. Obstruction of cystic duct by, a, stone or stones; b, adhesions or angulations; c, pressure from without, tumors, lymphatic glands; d, inspissated mucus—hydrops.
2. Gallbladder contents may be entirely calculi and no, or relatively little, bile.
3. Weakness of gallbladder musculature—atony, dilatation, or too weak to move its fluid contents.
4. Tarry bile.
5. Fibrosis of the gallbladder.

The scope of this paper does not embrace the technic for taking the plates nor do I wish to intimate that other methods may not be employed and the same results obtained. The purpose sought at this time, however, was merely to focus attention on the diagnostic and therapeutic possibilities involved in the method, with the hope that a more general interest and a wider application of the procedure might be stimulated among the profession.

616 MADISON AVENUE.

Carcinoma of the Stomach Simulating Pernicious Anemia*

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The chief reason for presenting this case is not that it is unusual or new, for Osler and others have reported similar cases, but because of the interesting points presented by an analysis of the history, physical signs, and laboratory studies.

The patient, Mrs. H. C., widow, aged sixty-seven, white, was admitted to the Samaritan Hospital, February 23, 1921, under the service of Dr. W. E. Robertson. Her chief complaints were weakness, pain in the lower right chest and epigastrium, diarrhea (three or four bowel movements daily), numbness and tingling of hands and feet, and other paresthesia. The pain was of a shooting character, worse at night, and began in the lower right chest, radiating to the epigastrium. She said her health had been failing since May, 1920, at which time the pain first occurred. The pain usually occurred in

the early afternoon and lasted well into the night; as a rule she did not sleep well on that account. Her appetite was good; the pain was not influenced by the quality or quantity of food, nor was there any time relationship to food, but it was increased after a bowel movement. At times the patient suffered from nausea, belching, and a sour taste in her mouth, but she never vomited. There was some shortness of breath and she tired easily. She had a slight dry cough, and had lost thirty pounds in the past year. Menopause occurred at forty-two. She denied venereal infection. Had always had good health up to the present illness. She had two children, living and well; no miscarriages. Her husband was killed by accident twelve years ago. Her father died before she was born, cause unknown; her mother died of tuberculosis, and two sisters died of pneumonia. Her family history was otherwise negative.

*Read before the Northern Medical Society, Philadelphia, May 27, 1921.

Physical examination.—Temperature varied between 97° and 99.5°; pulse rate between 70 and 90; respiratory rate between 20 and 26. The patient was found to be very anemic. The mucous membranes were blanched and the skin of the covered parts resembled the whiteness present in an advanced case of parenchymatous nephritis, while the skin of the face and arms was of a lemon yellowish hue. There was no jaundice. Her adipose tissue was well preserved, but her musculature was flabby and her lips were cyanotic. Marked pyorrhea was present, with roots and snags. There was moderate general adenopathy. The chest was somewhat emphysematous. There was an area of fulness and dullness under the first portion of the sternum, continuous with the cardiac dullness and extending two and a half cm. to right of right sternal line and four cm. to the left of left sternal line. There was also an area of dullness posteriorly extending from a line across the spines of the scapulae down to ten cm. below, and laterally from left midscapular line to five cm. to the right of the spinal column. The right border of cardiac dullness was two and a half cm. to the right of the right sternal line, while the left border was in the midclavicular line. A slight thrill, systolic in time, was palpable at the base of the heart. A murmur was heard to the right of this area (systolic in time) and was conducted to the vessels of the neck. Heart sounds were weak. There was an accentuation of aortic second sound. The vessels were slightly fibrosed, pulses of low tension, and equal on both sides. Blood pressure, systolic 108, diastolic 84. The abdomen was found to be relaxed though frequently distended with gas; no fluid present, and no localized rigidity or tenderness. The liver was slightly enlarged, with upper border at fourth interspace and lower border five cm. below costal margin. The extremities showed no edema. Reflexes were exaggerated. There was a scar on the left leg which showed some ulceration, which the patient said was due to an old burn. Rectal and vaginal examinations were negative.

The features, then, which seemed most striking from the viewpoint of the history were: 1. Pain in the lower right chest and epigastrium, which had no relation to time or quality of food. 2. Gradual and progressive loss of strength and moderate loss of weight. 3. Paresthesia of hands and feet and of other parts of the body. 4. Fairly good appetite and tendency to diarrhea.

On physical examination the most striking features were: 1. The marked pallor, the lemon yellowish color of face and extremities, the weakness with preservation of adipose tissue. 2. Pyorrhea. 3. Physical signs of aneurysm of the arch of the aorta, confirmed by x ray and fluoroscopic examination, and by two Wassermann tests, both of which were reported delayed negative (which we considered positive because of the presence of the aneurysm).

The problem we were called upon to solve was the etiology of the anemia and the right inferior thoracic and epigastric pain. Was the cause intra-abdominal or extraabdominal? If intraabdominal, the most likely conditions seemed cholecystitis, gastric ulcer or cancer. If extraabdominal, aortic

aneurysm or pernicious anemia; or the combination of these two might explain the symptoms.

It was here that the laboratory was brought into play and added to the confusion. A fractional gastric analysis was made on February 24, 1921, which showed a free acidity varying from 54 to 70 and a total acidity varying from 92 to 126. Occult blood and lactic acid were negative. The gastric analysis was repeated several times with the same result, except that in a number of specimens the occult blood test was positive. A duodenal tube was introduced repeatedly but could not be made to enter the duodenum. X ray examination of the stomach showed absence of the duodenal cap. The gall-bladder was negative.

These data would favor the diagnosis of gastric ulcer but the history and physical findings were against it, and they did not seem sufficient to explain the anemia. The diagnosis of pernicious anemia was then considered; clinically it was a well marked case as shown by physical examination. We also felt that factors were present in this case which favored such a picture, namely, the severe pyorrhea and the possibility of syphilis. Intestinal parasites were ruled out by an examination of the stools.

Several blood counts were therefore made at different times with the following results: 1. Red blood cells varied from two to three million, usually two and one half million to the cm.m., while the hemoglobin varied from sixty per cent. to sixty-five per cent., thus giving a plus one color index. 2. The leucocyte count varied from 18,000 at the first count gradually coming down to 5,200, while the polymorphonuclears were usually above seventy per cent. 3. There were also slight poikilocytosis and anisocytosis, some granular degeneration, and occasional normoblasts. The blood picture, on the whole, looked more like a secondary anemia, due possibly to some focus of infection or suppurative process.

A number of urine examinations were also made, but had no bearing on the case except that they showed moderate interstitial involvement of the kidneys. Carcinoma was then considered but the high acidity, the relatively insignificant loss of weight, and the absence of other physical signs were against it.

What then was to be the treatment in such a case? An exploratory laparotomy would have cleared up the diagnosis, as far as the abdominal condition was concerned, but the patient's general weakness did not justify such a procedure. We therefore had to content ourselves with treatment more or less symptomatic. The pyorrhea was treated locally and several roots were extracted.

Alkalies and belladonna were given to counteract the hyperacidity, and small doses of neosarsphenamine were injected intravenously and other anti-syphilitic treatment was also given. Blood transfusion was recommended, but was practised only once on account of the failure of the donor to appear. The patient, however, did not improve but became gradually weaker, and died April 19, 1921, two months after her admission.

Editorial Articles

CYSTS OF THE MESENTERY AND THE MESOCOLON.

The diagnosis of cysts of the mesentery is difficult because objective signs are wanting, and in cysts of the mesocolon it is probable that a diagnosis has never been made before the abdomen was opened. The only clinical indication of cysts of the mesentery and mesocolon is an increase in the size of the abdomen. Their onset is insidious, and except in those cases where the patient has consulted a physician because of abdominal enlargement, the subject is not seen until a sudden pain occurs, due to an intestinal occlusion from the pressure exercised by the tumor. The umbilical region is the most frequent site of the pain at the beginning, and from there it spreads over the abdomen.

One of the principal characters of these tumors is that they are mobile transversely and frequently also horizontally. This transverse mobility distinguishes them from pancreatic cysts. By palpation their surface is found to be smooth and fluctuation may be elicited at certain spots, while a tympanic area is often present in front of the tumor. When the cyst has attained considerable size, certain disturbances resulting from compression arise, particularly of the digestive tract.

The evolution of these cysts is prolonged in most cases and the symptomatology is vague, none of the signs mentioned above belonging exclusively to them. Pancreatic cysts progress more rapidly and affect the general health in a marked degree. It is evident that a differential diagnosis between cysts of the mesentery and mesocolon must be made between many intraabdominal growths, particularly ovarian cysts, renal tumors, hydronephrosis, and pancreatic cysts, as well as acute inflammatory abdominal processes, such as appendicitis.

In addition to cysts of the mesentery and mesocolon properly speaking, other cysts may develop in the folds of the peritoneum and have the same pathology as the former. These are cysts included in the mesoappendix and gastrohepatic omentum. As to frequency of occurrence, the statistics published by Herrera Vegas showed ten cysts of the mesocolon, two of the mesentery, and one each of the mesoappendix, gastrohepatic omentum and gastrocolic ligament.

According to their contents, cysts of the mesentery and mesocolon may be divided into hydatid and serous cysts. The former are rare, and when they do occur there is an echinococcosis elsewhere in the

abdominal viscera. The serous cysts are due to some morbid change in the lymphatic system. Their walls are composed of three strata: a fibrous external stratum, a middle one, very vascular, composed of connected tissue, lymphoid tissue and lymphatic follicles, while the internal layer is epithelial. The contents are fluid, but become creamy, and when they contain blood assume a brownish hue. The specific gravity of the fluid is about 1.004. Chemically, the liquid is alkaline, containing albumin but no fibrin, carbonates, sodium chloride and sulphates in crystals. Throughout the fluid, cells are seen which have undergone fatty degeneration and even some fat globules may be present.

The origin of these cysts is generally attributed to the lymphatic system and three hypotheses have been put forward to explain them, namely, degeneration of the lymph nodes, ectasis of the lymphatic or chyloferous canals, and rupture of lymphatic vessels with encystment of the escaped fluids. It should be remembered that Dickenson has reported the pathological examination of a very complex growth of the mesentery containing cartilaginous and bony foci developed in masses of connective tissue and fat and cysts lined with endothelium with cilia. This case is unique, but from that very fact interesting.

MALIGNANT TRANSFORMATION OF DUODENAL ULCER

Malignant transformation of duodenal ulcer has been regarded as rare, but an exception to this is made by Meulle in his thesis (Paris, 1913) in the case of callous ulcer which appeared to have a great tendency to malignant change, since he found that it took place in fifty per cent. of the cases of ulcer. An examination of 216 cases of duodenal ulcer at the Mayo Clinic, in which resection had been performed, showed that cancerous change was present in sixty-three per cent. of the cases. Out of a total of thirty cases Kuttner found thirteen undergoing malignant transformation and this was found to be the case by Kelling in eight out of eleven cases of callous duodenal ulcer. The latter seems to have the same tendency to malignancy as callous ulcer of the stomach.

Perhaps the callous ulcers of the duodenum in which malignant transformation has taken place, are in reality gastric ulcers, because statistics deal with specimens excised in which the pyloric region is deformed and where a distinction is difficult to

make between the stomach and the duodenum. The starting point of the carcinoma often is not noted precisely and undoubted instances of ulcer-cancer of the duodenum are not common. Mayo even believed that malignant transformation is as rare in the duodenum as it is common in the stomach, having met with only four cases, and of these two were doubtful.

Moynihan has encountered two cases of duodenal cancer and believes that in one case at least ulcer was the starting point, because the patient had a past history of duodenal ulcer. Perry and Shaw recorded five cases, but in only two was the relation between ulcer and cancer distinctly proved at autopsy. Other cases have been reported by competent observers.

The rarity of cancer of the duodenum developing from ulcer may be accounted for by the fact that there is a greater infrequency of callous ulcer of the duodenum than of the stomach. Nevertheless, duodenal cancer certainly exists and further research is necessary to ascertain if it is really as uncommon as is generally supposed. Hartmann, of Paris, recently published three authentic cases while Houdard records another in which microscopical examination left no doubt that the growth developed from an ulcer.

PROTECTION FROM X RAYS.

In consequence of the death of Dr. Ironside Bruce, radiologist to Charing Cross Hospital, London, from the effects of continued exposure to x rays of a highly penetrating nature, and in view of the fact that the existing means of protection for workers was insufficient in the altered circumstances, a committee was appointed to consider the dangers involved in modern x ray work and to endeavor to suggest adequate measures for safeguarding the health of those engaged in this kind of work. The report of this committee, which has just been issued, lays stress on the danger of overexposure to x rays and radium, but states definitely that these dangers can be avoided by the provision of efficient protection and suitable working conditions.

The effects to be guarded against, so far as at present known, are, first, visible injuries to the superficial tissues, the skin, etc., which may result in permanent damage. Second, derangements of internal organs and changes in the blood, which are especially important as their early manifestation is often unrecognized. The committee urges, as a general precaution, that not more than seven working hours a week should be undertaken and that operators should spend as much time as possible out of doors. An annual holiday of one month or

two separate vacations of two weeks each are also advised, and nurses employed as whole time workers in x ray and radium departments should not be called upon for any other hospital service. Various precautions are mentioned in detail, and the importance of thorough ventilation is emphasized. Indeed, ventilation is regarded as being of supreme importance. The x ray room should not be below ground level. Artificial ventilation is necessary in most instances, for, with very high potentials, so-called coronal discharges are difficult to avoid, and these produce ozone and nitrous fumes, both of which are prejudicial to the operator. Dark rooms are capable of being opened up to sunshine and fresh air when not being used. The walls and ceilings of these rooms are best painted some more cheerful hue than black. Precautions against injury in using radium are also noted in detail.

The impression to be gained from a careful reading of the report is that the dangers attending the employment of x rays have in no wise been exaggerated. It is understood that the committee intends to add to the value of its work by endeavoring to find out a method of arriving at an accurate dosage of x rays. This is an exceedingly difficult problem, as the rays themselves are capable of wide variation with respect to their wave lengths, and the susceptibility of the body tissues varies also. The solution of this problem is urgent, as accurate knowledge of dosage is essential to the complete safety of the workers. It is hoped therefore that success will attend the efforts of the investigators.

PHYSICIAN AUTHORS: DR. CHARLES BALGUY

Dr. Charles Balguy was an English country physician of the eighteenth century, unknown to fame then and unknown to fame now despite the fact that millions of people have enjoyed his literary work, for in 1741 he gave Boccaccio's *Decameron* the English dress that it has worn ever since. The *Decameron* sold in bookshops today is the Balguy translation with modernized spelling and only a few slight modifications, generally for the worse. The editions of today also include two stories, exceedingly licentious, which Balguy thought it best to omit. The great difference in style makes it easy to detect these two. Prior to Balguy's there had been only one translation of the *Decameron* into English. It appeared in 1620 and was published by Isaac Jaggard. But this was a gross and unliturgical product, and beside, it was translated very inaccurately, apparently from the French version of Antoine Le Macon. Balguy's translation, made

direct from the original Italian, is a masterpiece of noble English and so vastly superior to the Jaggard folio in all respects that it was adopted by publishers as the standard and has been reproduced in all subsequent editions. The Jaggard translation quickly went into oblivion, where it has remained ever since. Only a few collectors of rare books know it now. In his preface, speaking of the *Decameron*, Dr. Balguy says: "This hath been reprinted an infinite number of times and translated into divers languages. Two translations there are in French that have come to my knowledge, and the same number in our own language, if they may be styled so, for such liberties are taken everywhere in altering everything according to the people's own taste and fancy, that a great part of both bears very little resemblance to the original." Up to the time of the Jaggard translation, however, the *Decameron* had been known in England only in fragments and Balguy's translation was the first and only one published after that put forth by Jaggard. The other translation to which Balguy probably refers is William Paynter's *Palace of Pleasure* (1566), which, however, contained only about sixty *Decameron* tales and was a mixture of Queen Margaret, Bandello, Straparola, Livy, Herodotus, Aulus Gellius, Boccaccio and others. But Paynter did not pretend to translate. He stole the tales of others and wrote them in his own way as his own—thereby creating a treasure house which many others after him pillaged, including Shakespeare, who got his plot for *Romeo and Juliet* from the *Palace*. In those old days, as Charles Whibley points out, plagiarism does not seem to have been regarded as a heinous sin.

Never has an edition of the *Decameron* carried Dr. Balguy's name. Edition after edition has been published either without any acknowledgment or with only a bare reference to the edition of 1741, despite the fact that they are printed practically word for word from the 1741 edition. Dr. Balguy himself was somewhat to blame for his obscurity, for his translation crept into the world anonymously and it is doubtful if the later publishers were aware of his connection with it or had ever heard his name. The translation was first published by R. Dodsley, the famous eighteenth century London publisher, when Dr. Balguy was thirty-three years old and it was a closely and well printed octavo of 591 pages, dedicated "to Backe Thornhill," a relative and friend of Dr. Balguy.

S. P. Addy, writing in the *Journal of the Derbyshire Archaeological and Natural History Society*, (Vol. 6, 1884), says: "My own copy of Balguy's translation was described by Mr. Quaritch, of whom

I bought it, as being bound in 'bright old calf.' The stories themselves are bright as Italian skies. . . . It was Charles Balguy's task to present those old stories in a fair English dress, and he accomplished that task well. His English is always pure, and some parts of the prose translation read like poems. His metrical versions have no great merit. They are merely such as a scholarly writer would make in an age when everybody imitated Pope. His prose has the true Addisonian ring and the archaisms which have been altered in subsequent editions have no uncouthness to the literary eye. Whether Balguy ever lived in Italy I know not, but he had certainly a scholarly acquaintance with Italian literature. . . . In his boyhood members of his family had espoused the cause of James Stuart, the Pretender. Had he lived in our time, he might have forsaken the older scholarship and written a good novel or two. As it was, he practised physic and contented himself with translating the *Decameron*. In 1741 the modern novel had hardly been 'invented' . . ."

Dr. Balguy came of an old Derbyshire family (originally de Balgi) who had been seated in that part of England since the time of Edward I. They were possessed of large estates which included the famous old Derwent Hall, where Dr. Balguy was born in 1708, the youngest of a family of five daughters and two sons. He was educated at the Chesterfield Grammar School, under the Rev. William Burrow, M. A. For many years the masters of this school were men of the first literary eminence and the school was reckoned one of the best in the north of England. Ellis Farnworth, translator of Machiavel; Halifax, Bishop of Gloucester; Dr. John Jebb, an eminent Eighteenth century physician; Dr. Samuel Pegge, the antiquary; Secker, Archbishop of Canterbury; Dr. Erasmus Darwin, grandfather of Charles and author of *The Botanic Garden*, and other notables were educated at this school. At the age of eighteen Balguy entered St. John's College, Cambridge, (July 5, 1725) and took his degree of Bachelor of Medicine in 1731. He was made a Doctor of Medicine at Cambridge in 1750. He died March 2, 1767, at the age of fifty-nine years and was buried in the chancel of St. John Baptist's church at Peterborough, where he had practised medicine for many years. A marble tablet on one of the chancel piers describes him as "a man of strict integrity, various and great learning, and of distinguished eminence in his profession." Whether he ever married is uncertain. Dr. Peege, his companion at Chesterfield, says he did, but there is no mention of wife or children in his will or on the memorial tablet.

Other than his translation of the *Decameron*, Dr.

Balguy's literary output was slender. In 1734 he contributed to the *Philosophical Transactions of the Royal Society* an account of "the dead bodies of a man and woman preserved forty-nine years in the moors of Derbyshire" and in 1736 he contributed to the *Medical Essays*. In 1758 he wrote the *Epistola de Morbo Miliari*, evidently a short Latin treatise on some form of pulmonary disease. Any other writing or translating he may have done is unknown. And few know that he translated that precious volume of tales of the days when "all men were gallants and all women grandes dames and all birds nightingales." But in that he has merely suffered the melancholy fate of most translators, for the way of the translator is hard. Only a few brilliant exceptions, such as Burton's *Arabian Nights*, Fitzgerald's *Omar*, Chapman's *Homer*, the *Plutarch's Lives* of Sir Thomas North, the *Rabelais* of Urquhart and Motteux and a few others such as these, are remembered. The majority are forgotten. Balguy has perhaps been more completely forgotten than any of the rest.

DOCTORS' FEES

The pronouncement of the Johns Hopkins Hospital authorities, that the surgeon should not charge more than a thousand dollars for any operation and not more than thirty-five dollars a day for attendance on any patient, has directed the attention, not only of the medical profession but also of the lay press, to the question of physicians' fees. One of the great difficulties encountered in discussing the question of physicians' fees is that of determining how large a part of the physician's time is devoted to eleemosynary work. Any effort to place an arbitrary and universal limit upon the fees to be charged would work a hardship in many instances and would be as little welcomed by the patient as by the surgeon.

The general practice in the medical profession as in transportation has been to "charge what the traffic will bear." In transportation one of the fixed charges is the free transportation of employees and their families. Some one must pay for these free rides and consequently their cost is merged in the general overhead and eventually figures in the cost of transportation charged against paying patrons. In very much the same way the members of the medical profession do a great deal of charity work. They attend patients both in and out of hospital from whom they never expect to receive any remuneration whatever. This service is part of the overhead in the practice of medicine and must be paid for by those who have the means to pay for expert medical advice.

The mere formulation of a rule by any one hospital cannot be expected to govern the actions of the profession as a whole. The vast majority of surgeons would be delighted to accept a fee of a thousand dollars for an operation and the number who have ever received any such fee is relatively small. But for the expert surgeon, who by specialization in some particular field and by reason of extraordinary skill has built up a national reputation, limiting the maximum fee to a thousand dollars would be unfair. Men of great wealth who require the services of such experts will not hesitate to pay many times this sum named and would consider the service rendered as entirely adequate.

Among lawyers we frequently hear of fees vastly in excess of anything paid to medical men and no question of profiteering is raised. It seems to us unfortunate that so conservative an institution as the Johns Hopkins Hospital should have taken action which has been construed by the general public as setting a maximum fee, though the hospital authorities no doubt would disclaim any such idea and probably intended merely to suggest a maximum fee for the members of its own particular hospital staff and had no idea of attempting to dictate to the medical profession at large in this matter.

PROFESSIONAL SECRECY.

The breach of professional secrecy in the Stillman divorce case has directed public attention in the United States to the question of professional secrecy as it applies to the physician. In Great Britain the subject came to the fore about the same time as a result of a ruling made by Mr. Justice Horridge to the effect that information acquired at a venereal clinic was not "privileged" but that the physician must testify or be subject to proceedings for contempt of court. This ruling brought the matter before the British Medical Association at its recent annual meeting and the subject was discussed at great length and with much diversity of sentiment. A resolution was first introduced by the council to the effect that when called into court the physician should obey the direction of the presiding judge regardless of the wishes of the patients. Eventually, however, another set of resolutions was introduced which recommended "that the association use all its power to support a member who refuses to divulge, without the patient's consent, information obtained in the course of his professional duties, except where it is already provided by the act of parliament that he must do so." Such an act of parliament already exists regarding the notification of certain diseases. It is intimated that an effort will be made to bring about a test case in England with a view to determining not only the precise legal status of the physician in the matter of professional secrecy but also the attitude of the judiciary and the public as well. It is contemplated that eventually the question of professional secrecy for

medical men in Great Britain will be definitely defined by act of parliament.

In the United States the courts have taken a rather more liberal view of the subject than that taken by Mr. Justice Horridge and where the physician has declined to answer on the ground of professional secrecy his actions have usually been upheld by the courts.

Many problems are presented, of course, in this matter of professional secrecy, particularly where criminal law is involved. On the whole, the attitude of the medical profession and the courts of the United States differs somewhat from that in Great Britain, both physicians and courts in this country being more inclined to recognize the claim of the physician for exemption from testifying where the testimony would involve a betrayal of professional secrecy. The public outcry against the doctor in the Stillman case, who, by the way, was an osteopath, shows that the public generally supports the medical profession in its efforts to preserve professional secrets as inviolate, even in the courts of law.

THE ORIENTAL SORE.

The last inquiry as to the etiology and removal of the oriental sore contradicts somewhat the classical literature which says that the majority of cases seem to be confined to one place and to exist under the same conditions. Cases outside this zone are rare. Those observed recently in Crete convince us that they are not ectopic, but seem to have a real hotbed there, the principal places being La Canée, Rethymno, and in all the region which extends from Héracleion to the Plain of Messara. It is found in the east, but rarely at Sitia. At Canée it is frequently found in the crowded quarters of the old town. In Crete, man alone seems to be troubled, and epidemiological investigations prove it transmissible without the intervention of a biting insect. Contaminated flies cannot transmit it after five hours. The report is fully given in the February, 1921, number of the *Annales de l'Institut Pasteur*.

SOUTH AFRICA'S NEEDS.

It does seem somewhat unfair to medical eyes that large fortunes, amassed during life in South Africa, particularly in mining, should go largely to English charities, and Dr. R. P. Mackenzie, in his address as retiring president of the British Medical Association, Witwatersrand Branch, dwelt somewhat bitterly on the fact that in his neighborhood the Chronic Sick Home at Rietfontein is quite inadequate for the numbers waiting, also that the only tuberculosis sanatorium is that provided by the Chamber of Mines at Spring Kell, and it is only lately that they have agreed to accept municipally paid for cases. A large bequest was made recently to hospitals in London by a man who had made his money in South Africa, yet only £2,000 came here—£1,000 to the New Somerset Hospital at Cape Town, £1,000 to the Kimberley Hospital. Naturally a man's thoughts turn home, but common justice demands a share of that gained in another country.

News Items.

Typhus on an Ocean Liner.—A case of typhus was discovered among the second cabin passengers of the *Aquitania*, when the ship reached quarantine a few days ago. The patient was a Russian refugee.

Colorado Hospital for War Veterans.—Under an Executive order signed August 20th by President Harding, the Veterans' Bureau has taken over the naval tuberculosis hospital at Fort Lyons, Las Animas, Colorado. It will be used as a tuberculosis institution for war veterans. The capacity is 780 beds.

War Nurses Sought for Relief Work in Russia.—War nurses will be recruited in the United States for aid in administering American relief to Russia's needy children, according to plans completed by Secretary Hoover. Several hundred nurses will be selected largely from the ranks of those who saw service in France.

Typhoid Fever Epidemic in New Jersey.—The State Department of Health has sent all its available forces to Burlington County where there is a serious epidemic of typhoid fever. It is said that more than two hundred cases have been reported in twelve towns of this county. Dr. J. B. Fitzrandolph, assistant director of the State Board of Health, and Dr. David Bowen, state epidemiologist, are in charge of the situation.

School for Ship Doctors.—Dr. William H. Dieffenbach, on behalf of the Board of Directors of the Broad Street Hospital, New York, announces that ship doctors are to have a medical graduate school of their own. He points out that maritime doctors would be enabled through such a school to perfect themselves in the latest technic of the profession, with particular attention to the diagnosis and treatment of transmissible diseases, in order to nullify the spread of ailments likely to develop into a plague.

School of Public Health at Harvard.—Through a gift of \$1,785,000, made by the Rockefeller Foundation, Harvard University will establish a School of Public Health. The purpose of the school is to train public health administrators, making of such work a distinct career rather than leaving it to general practitioners. Special courses in preventive medicine, tropical medicine, and industrial hygiene are already taught, but the enlarged school will offer opportunities in public health administration, vital statistics, immunology, bacteriology, medical zoology, physiological hygiene, and communicable diseases.

United States Civil Service Examinations.—The United States Civil Service Commission announces an examination for associate in clinical psychiatry and psychotherapy to fill vacancies in St. Elizabeth's Hospital, Washington, D. C., at \$2,500 a year. Papers will be rated as received until November 1st. There will also be an examination for röntgenologist, associate röntgenologist, assistant röntgenologist, and junior röntgenologist for positions ranging from \$70 to \$250 a month. Applications will be rated as received until December 1st. Further information may be obtained from the Civil Service Commission, Washington, D. C.

France in Danger from Epidemics of Cholera and Typhus.—According to cable dispatches from Paris, dated August 20th, France's health experts are beginning to worry over the fact that not having established a system of sanitary inspection of immigrants for contagious or infectious diseases, there is nothing to prevent the spread of these diseases into French territory.

Meeting of Maine Medical Association.—On June 27th to 29th, the sixty-ninth annual meeting of this society took place in Bangor. Dr. Theodore E. Hardy, president, and Dr. George R. Campbell, vice-president, presided. The following officers were elected: President, Dr. Addison S. Thayer, Portland; president-elect, Dr. Langdon T. Snipe, Bath, and secretary-treasurer, Dr. Bertram L. Bryant, Bangor.

Medical Intern, Saint Elizabeth's Hospital.—The United States Civil Service Commission announces an examination for medical intern to fill vacancies in Saint Elizabeth's Hospital, Washington, D. C., at \$1,200 a year and maintenance. The examination is open to both men and women. The positions are tenable for one year. Applications will be rated as received until November 1, 1921. For further information address Civil Service Commission, Washington, D. C., applying for Form 1312.

Infantile Paralysis in New York.—Ten cases of infantile paralysis have been reported in Westchester County, thirty-three in Utica, and others in various parts of the state, making a total of about one hundred cases. In Greene County there have been five cases with two deaths. In New York city, during the first eighteen days of August, fifty-eight cases were reported, all of a mild type, with eight deaths. Active steps are being taken by the health authorities of both state and city health departments to control the outbreak and it is said that there is no immediate cause for alarm.

Personal.—Dr. and Mrs. Gregory Stragnell, of New York, announce the birth of a daughter, on Wednesday, August 17th.

Dr. George O'Hanlon, general medical superintendent of Bellevue Hospital, and Dr. John W. Perelli, member of the Board of Trustees, have been made Chevaliers of the Crown of Italy by T. F. Bernardi, the Italian Consul General. The decorations were authorized in recognition of the work of the two physicians in the reorganization of the Italian Hospital, East Eighty-third Street.

American Society for the Control of Cancer.—Dr. John C. A. Gerster has been appointed chairman to organize a Metropolitan district for the National Cancer Week campaign, for an attack on cancer in Greater New York, Long Island and Westchester counties. Dr. George E. Armstrong, of Montreal, has undertaken to organize the society's work throughout the Dominion of Canada. Dr. Joseph Bloodgood, regional director for the States of Maryland, Virginia and Delaware, has asked Dr. Robert C. Bryan, of Richmond, to organize the State of Virginia. Dr. V. J. LaRose, of Bismarck, has accepted the chairmanship of North Dakota, and Dr. Fred E. Clow, of Wolfeboro, has been appointed chairman for New Hampshire.

American Gastroenterological Association.—At the twenty-fourth annual meeting of the American Gastroenterological Association, held in Boston, June 6th and 7th, Dr. Allen Jones, of Buffalo, was elected president for the coming year. The vice-presidents are Dr. George B. Eusterman, of Rochester, Minn., and Dr. R. Walter Mills, of St. Louis; secretary, Dr. Arthur F. Chace, of New York; treasurer, Dr. Clement R. Jones, of Pittsburgh, and recorder, Dr. Ernest Gaither, of Baltimore.

Died.

BANTLEY.—In Danville, Ill., on Tuesday, August 9th, Dr. Barth Bantley, aged seventy-four years.

BOICE.—In Sistrerville, W. Va., on Wednesday, August 3rd, Dr. John M. Boice, aged sixty-five years.

BROUGH.—In Boston, Mass., on Sunday, July 31st, Dr. David D. Brough, aged fifty-one years.

COLL.—In New York, on Wednesday, August 10th, Dr. Arthur P. Coll, aged fifty-five years.

COY.—In Napoleon, Ohio, on Tuesday, August 9th, Dr. Henry C. Coy, aged sixty-six years.

CRYER.—In Lansdowne, Pa., on Friday, August 12th, Dr. Matthew H. Cryer, aged eighty-one years.

DYER.—In Whitman, Mass., on Friday, August 5th, Dr. E. Alden Dyer, aged sixty-four years.

EISENBERG.—In Norristown, Pa., on Saturday, August 13th, Dr. Phillip Y. Eisenberg, aged seventy-four years.

FELTY.—In Gettysburg, Pa., on Sunday, August 7th, Dr. John C. Felty, aged seventy-two years.

FRENCH.—In Rochester, N. Y., on Thursday, August 11th, Dr. Robert T. French, aged sixty years.

GREEN.—In Long Gree, Md., on Tuesday, August 2nd, Dr. John S. Green, Sr., aged sixty-four years.

GRESHAM.—In Birmingham, Ala., on Saturday, July 30th, Dr. A. Belton Gresham, aged forty-four years.

HAMBRIGHT.—In Philadelphia, Pa., on Wednesday, August 10th, Dr. Edwin A. Hambright, aged seventy-five years.

HILLER.—In Bellefonte, Pa., on Monday, August 8th, Dr. Hiram M. Hiller, of Chester, Pa., aged fifty-four years.

HIRST.—In Salisbury, N. Y., on Monday, August 8th, Dr. Patrick J. Hirst, aged thirty-six years.

INGOLDSBY.—In Dorchester, Mass., on Tuesday, August 9th, Dr. Joseph E. Ingoldsby, aged forty-eight years.

LEIDY.—In Reading, Pa., on Monday, August 15th, Dr. Thomas H. Leidy, aged seventy-six years.

MAHADY.—In Rome, N. Y., on Monday, August 8th, Dr. Charles Mahady, aged forty-nine years.

MCWHORTER.—In Akron, Ohio, on Monday, July 18th, Dr. John S. McWhorter, aged eighty-three years.

MEIGHEN.—In Littleton, W. Va., on Tuesday, July 9th, Dr. Thomas H. Meighen, of Wheeling, W. Va., aged fifty-six years.

MINDEL.—In Wildwood, N. J., on Sunday, August 14th, Dr. Henry W. Mindel, of Philadelphia, aged seventy years.

MOSEMAN.—In Point Pleasant, W. Va., on Monday, August 1st, Dr. Elmore Moseman, aged sixty-eight years.

OVIATT.—In Cleveland, Ohio, on Monday, August 1st, Dr. Wilson H. Oviatt, aged eighty-seven years.

QUESTA.—In Arcade, N. Y., on Tuesday, August 2nd, Dr. Guido J. Questa, aged twenty-five years.

REYNOLDS.—In New York, on Tuesday, August 16th, Dr. William Myron Reynolds, aged fifty-nine years.

SWIFT.—In West Chazy, N. Y., on Wednesday, August 10th, Dr. Frederic N. Swift, aged fifty-seven years.

TAFT.—In New York, on Monday, August 8th, Dr. Robert McLean Taft, aged forty-seven years.

WATSON.—In Sheridan, Ark., on Thursday, July 18th, Dr. H. P. Watson, aged one hundred years.

WHITE.—In Indianapolis, Ind., on Wednesday, August 10th, Dr. Charles A. White, aged seventy-six years.

WHITTINGTON.—In New York, on Tuesday, August 16th, Dr. Samuel Betts Whittington, aged fifty-two years.

WILSON.—In Pleasure Ridge, Ky., on Wednesday, July 27th, Dr. Jasper M. Wilson, aged eighty-nine years.

WINANS.—In Belleville, N. J., on Tuesday, August 9th, Dr. Joseph Clark Winans, aged forty-two years.

Book Reviews

A PIONEER IN PSYCHOANALYSIS.

Addresses on Psychoanalysis. By J. J. Putnam, M.D., Emeritus Professor of Neurology, Harvard University. With a Preface by SIGMUND FREUD, M.D., LL.D. International Psychoanalytical Library, No. 1. London, Vienna, and New York: The International Psychoanalytical Press, 1921. Pp. 470.

In many ways these collected papers by Dr. J. J. Putnam are of historical interest. They should have a special value at the present moment, being presented at a time when the British Medical Association has given official approval of the methods of psychoanalysis. For many the name of Putnam gave a certain cloak of respectability to the movement of psychoanalysis in America. Now the official sanction of the British Medical Association will do much the same thing. Putnam was first opposed to the tenets of psychoanalysis and looked with scepticism, if not ridicule, on the theory which ascribed the neurosis to a sexual etiology. When Freud, Jung, and Ferenczi visited this country some years ago Putnam made their acquaintance and was impressed by their personalities and their earnestness. This visit marked the beginning of his interest in analysis. From that time on until his death some ten years later he was an earnest worker and a staunch supporter of psychoanalysis. He found that analysis offered a pragmatic method for the cure of the neuroses. He also fought valiantly to place the theories before his medical colleagues. In this battle he admitted his own initial resistances and did everything in his power through lectures and papers to show medical men that they were ignoring and combatting a theory which would prove the most useful that could be adopted in the treatment and understanding of the psychoneuroses. He was ever on guard against the weaknesses of analysis and tried to confirm each step he took. He followed closely Darwin's dictum of examining the point of view of his opponents with the same care as that given to the view he accepted and set forth.

No doubt it was difficult for him to overcome his original puritanical environment but fortunately he was honest and always open to conviction. This honesty is shown in the way he has admitted the narrowness of the views he once held. Another example of such fearlessness has been shown by the English neurologist Stoddart.

In reading the collected papers in this volume, which is the first issued by the International Psychoanalytical Library, one is struck by the effort Putnam made to show the harmlessness of the Freudian sexual theory. He felt that once this phase of the

theory could be robbed of its obnoxiousness it would be more readily accepted by the medical profession. Would that this were true. Unfortunately he did not realize that many personal weaknesses prevented an acceptance of a theory which, if followed, would ferret them out. He did not fully take into consideration the additional resistance which was caused by an unwillingness on the part of physicians to give up the old classifications—the last thread that bound them to their old professors.

In these papers we can follow Putnam when he tried to find out what the rebels in psychoanalysis had to offer. He sympathized with Jung's cravings for a metaphysical something which he could not find in following Freud too closely, but could not accept the conclusions as set forth by Jung, for they were too far from reality. It was this very reality which kept Putnam with his feet to the ground and his head up, for while he felt that he should like to see a fine philosophy evolved from analysis, still he felt the time inopportune as there was still too much work of a practical nature to be done. He clung with fervor to the belief that one day in the not too distant future analysis would form the foundation of a sublime philosophy. Perhaps his feelings were not far wrong. He saw how analysis had invaded almost every field of endeavor and he felt that it only required a correlation of this work to establish a new set of values. A following out of the "evaluation" of Nietzsche, but on a constructive plan.

The attitude of Adler gave him more pain, for he felt that Adler had much to offer, and indeed he admits that he derived

stimulation and received many fundamental ideas from Freud's former student. However, as in the case of Jung, he did not feel that Adler was right in the theories where he flatly contradicted Freud. So to the end of his days, while keeping his mind open to any criticism, he remained a true Freudian. He felt that the theories advanced by the Viennese savant were basic, and he found none by which they could be replaced. His rôle was not that of an original worker, as he added little new to the science of analysis, but he was a severe critic and used analysis in a practical way. His principal desires were to benefit his patients; to spread the gospel of psychoanalysis among his fellow workers; to see a new philosophy evolved from analysis. His first two wishes were fulfilled; the last remains to be accomplished by his successors.

In his addresses he cites many cases in detail which are of practical value, and he states lucidly



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the views of the opponents of analysis as well as what he considers its weakness. His writing is always fluent and enjoyable and this set of addresses should prove of interest to all medical men whether they agree with analysis or whether they are in a position similar to that occupied by Putnam when he first heard of this strange gospel.

Freud has written a brief preface in his usual clarifying manner and Jones has presented an obituary in which he pays homage to this great veteran in psychoanalysis.

INSTRUCTION FOR DIABETIC PATIENTS.

A Primer for Diabetic Patients. A Brief Outline of the Principles of Diabetic Treatment, Sample Menus, Recipes, and Food Tables. By RUSSELL M. WILDER, Ph. D., M. D.; MARY A. FOLEY, Dietitian, and DAISY ELLITHORPE, Dietitian, The Mayo Clinic. Philadelphia and London: W. B. Saunders Company, 1921. Pp. 76.

The title of this work adequately conveys the scope of this rather practical little book, which aims to instruct the diabetic patient in some of the basic ideas employed in the treatment of diabetes. Briefly and clearly the authors describe the function of foods in the general normal metabolism, their caloric values, and their methods of estimation. Then follows a brief chapter discussing the various components of foods—carbohydrates, fats, and proteins—examples of which are given; the rôle that they play in the production of energy, individually and collectively; their transformation in the process of metabolism into simpler substances which may at one stage or another, depending upon the severity of the diabetes, prove detrimental to the patient. Emphasis is placed on the importance of the knowledge of the relative proportion of carbohydrates, fats and proteins in foods, for the wise selection of a diabetic diet and menu. To aid the patient in this, a short table of foods in common use is appended, giving the percentage values of fats, proteins and carbohydrates, in definite weighed amounts of the particular food in question. In all this the metric system is employed.

The review of the steps in the dietary management, in which the principles of graduated restriction of carbohydrates, fats and proteins as exemplified by the starvation diet, with a view to controlling the sugar excretion, so successfully advocated by Dr. Frederic M. Allen, will help the diabetic patient to understand his disease more thoroughly. It will enable the patient to realize what to him, straining under the deprivation of foods to which he has been accustomed, may seem cruel and useless, is logical and necessary.

The complications as to the teeth, and skin, seen in the course of the disease, the importance and prevention of acidosis and coma, are duly stressed, and treatment briefly but clearly indicated. The value of the examination of urine by the patient himself, the methods and their significances also are referred to.

The latter part of the book deals largely with the question of diet, menus, and recipes. These the patient as well as the nurse will find exceedingly helpful, inasmuch as their selection is presented not in any haphazard fashion, but with a careful regard of the needs of the mild, moderate and severe diabetic. This book should be of value to the patient, as well

as the nurse, not to speak of the general practitioner who would acquire an intelligent cooperation on the part of his patients.

HEMORRHAGE.

Le Emorragie. Nelle Ferite d'Arma da Fuoco in Guerra. Dott. GIUSEPPE FANTOZZI, Assistente e Libero Docente, Institute di Clinica Chirurgica della R. Università di Pisa; diretto dal Prof. D. Taddei. Pescia: Benedetti & Niccolai, 1920. Pp. vii-385.

This is in many ways a remarkable work, consisting as it does of 376 pages of text and 116 pages of bibliography, all on the subject of hemorrhage. The writer begins with a section on the history of surgery in relation to hemorrhage, especially that of war injuries; he then goes on to the anatomy of the bloodvessels and to the blood, with special reference to coagulation. The main body of the text is then set forth, in which there are noted the following divisions: Wounds of bloodvessels; hemorrhage in general; primary external hemorrhage; interstitial hemorrhage; hemorrhage of the body cavities; secondary hemorrhage. Then follows an appendix which takes up shock, blood transfusion, and trench methods of arresting hemorrhage. Even the bibliography is systematically divided into sections on general consideration; bloodvessels; the cranium; the thorax; the abdomen; shock; and blood transfusion.

A prodigious amount of work must have been entailed in the preparation of this treatise and the author's personal views are so intermingled with citations from the literature that nothing of importance in any language can have escaped his searching eye. There is a characteristic European painstaking thoroughness about the volume and it would seem to deserve a place among the classics on the subject.

SURGICAL CLINICS.

The Surgical Clinics of North America. New York Number, April, 1921, vol. i, No. 2. Philadelphia and London: W. B. Saunders Company, 1921.

This number presents twelve clinics given by surgeons in various New York hospitals. Perhaps the most interesting article in the series is the clinic by Dr. Willy Meyer on The Importance of Posture in Postoperative Treatment, in which he points out that methodical insistence on certain postures in postoperative treatment will often enable us to avoid the eventual occurrence of serious complications, especially thrombosis.

There are interesting and practical clinics by Erdmann, Gibson, Hartwell, Albee, Buerger, Heyd, and others, all of which combine to make this a useful volume, both to the student and the practitioner.

LYMPHOID TUMORS.

Lymphosarcoma. Lymphatic Leucemia. Leucosarcoma. Hodgkin's Disease. By L. T. WEBSTER. The Johns Hopkins Hospital Reports, vol. xx, Fasciculus III. Baltimore, 1921.

This monograph contains the histories and a careful analysis of 123 cases of the group mentioned above. It represents an enormous amount of work in an attempt to simplify the classification of these much discussed conditions, and to eliminate a part of the confusion which surrounds them today. One must agree with Ewing that the complexities of the subject of lymphoid tumors depend chiefly upon

the lack of knowledge of their etiology, and until this has been disclosed, such studies as these cannot help greatly in solving the problem of their classification. However, among the few conclusions that Webster draws are the following: "The conditions described are all different manifestations of the same disease, and the term 'lymphadenosis, leukemic or aleukemic' would describe them better and simplify the classification until a definite etiological agent is found. This disease is not a neoplasm, but a direct response on the part of the lymphocytes to a chemotactic influence exerted by the disease causing agent. The presence of this substance in any tissue or organ produces there a local accumulation of lymphoid cells."

THE LOVE OF LIFE.

Back to Methuselah. A Metabiological Pentateuch. By BERNARD SHAW. New York: Brentano's, 1921. Pp. ci-300.

Shaw has threatened this work for many years. In his own criticism of Shaw, written for Frank Harris, he gives warning that he is planning a play which is going to set forth his ideas on creative evolution. Frank Harris found an imago in Shaw and Shaw in turn found his in Samuel Butler. When he wrote his own biography for Harris he felt that Harris was too full of his own ego to give a proper appreciation of Shaw—no doubt he was right. After a careful reading of *Back to Methuselah* and with a comprehensive appreciation of Butler, one feels that Shaw is not an adequate biographer of Butler. Shaw has found his Bible in Butler and there are few living authors who could better champion him. Perhaps if he had not made so great an effort and abandoned himself to fantasy so completely he would have succeeded better. There is plenty of room for the application of Butler, and his sound theory of creative evolution in the fields of reality, to busy Shaw and many other weaker contemporary writers.

There are parts of *Back to Methuselah* which show Shaw at his best, the Shaw we have known and enjoyed in his former plays. He confesses that he has been mediocre in his earlier works, that he has only imitated other mediocrities like Voltaire, Molière, and perhaps the almost forgotten supposedly English playwright called Shakespeare. He tells us that in the past he was only playing, that his near serious efforts were never taken seriously, that his previous efforts dealt with trivialities. Now, he insists, he makes his final effort and if we do not appreciate him our grandchildren may. However, he cannot complain if we read his products and express our most humble opinions.

Can it be that Shaw shows signs of senility? Is he going to join Conan Doyle, Bergson, and the many other gifted men who at some point in their search for truth abandoned themselves to metaphysics when they encountered an obstacle which they could not overcome? Why do they all seek a new form of immortality? Why are they not content with making the most out of reality and their own abilities? Why do they admit defeat in this peculiar way? Perhaps one day an answer will be found when the psychology of senility is better understood. For the present we must be content to

take what they offer and separate the wheat from the chaff.

Shaw has evolved in his concluding scenes a poultry yard myth of creation. Should this form of generation ever come into being it would cause a revision in the technic of obstetrics and in the studies of gynecology. This should be of primary interest to the specialists in these branches of the profession.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE EMPEROR JONES; DIFFERENT; THE STRAW. By EUGENE G. O'NEILL. New York: Boni & Liveright, 1921. Pp. x-285.

NERVOSE ANGSTZUSTANDE UND IHRE BEHANDLUNG. Von Dr. WILHELM STEKEL, Nervenarzt in Wien. Dritte, Vermehrte und Verbesserte Auflage. Berlin and Wien: Urban & Schwarzenberg, 1921. Pp. x-672.

DIE GESCHLECHTSKALTE DER FRAU. Eine Psychopathologie Des Weiblichen Liebeslebens. Von Dr. WILHELM STEKEL, Nervenarzt in Wien. Zweite Verbesserte und Vermehrte Auflage. Berlin and Wien: Urban & Schwarzenberg, 1921. Pp. xii-490.

DIAGNOSTIK UND THERAPIE DER LUNGTUBERKULOSE. Von HEINRICH GERHARTZ, Professor Dr. med. et phil. Dritte, verbesserte Auflage. Mit sixty-seven teils farbigen Abbildungen und XVI teils farbigen Tafeln. Berlin and Wien: Urban & Schwarzenberg, 1921. Pp. x-296.

THE ANATOMY OF THE HUMAN SKELETON. By J. ERNEST FRAZER, F.R.C.S. Eng. Professor of Anatomy in the University of London and Lecturer in the Medical School of St. Mary's Hospital; Examiner in Anatomy for the University of London. Second Edition, with 219 Illustrations. Philadelphia: P. Blakiston's Son Co., 1920. Pp. viii-284.

INFECTIONS OF THE HAND. A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hand, and Forearm. By ALLEN B. KANAVEL, M.D., Assistant Professor of Surgery, Northwestern University Medical School; Attending Surgeon, Wesley and Cook County Hospitals, Chicago. Fourth Edition, Thoroughly Revised. Illustrated with 185 Engravings. Philadelphia and New York: Lea & Febiger, 1921. Pp. xiii-500.

THE CLINICAL EXAMINATION OF DISEASES OF THE LUNGS. By E. M. BROCKBANK, M.D. (Vict.), F.R.C.P. Hon. Physician, Royal Infirmary, Manchester; Lecturer in Clinical Medicine; Dean of Clinical Instruction, University of Manchester, and ALBERT RAMSBOTTOM, M.D. (Vict.), F.R.C.P., Hon. Physician, Royal Infirmary, Manchester. Lecturer in Clinical Medicine, University of Manchester. With Illustrations. New York: Paul B. Hoeber, 1921. Pp. viii-88.

NUTRITION AND CLINICAL DIETETICS. By HERBERT S. CARTER, M.A., M.D., Assistant Professor of Medicine, Columbia University, Associate Attending Physician to the Presbyterian Hospital, and Consulting Physician to the Lincoln Hospital, New York; PAUL E. HOWE, M.A., Ph.D., Associate in Animal Pathology, Rockefeller Institute for Medical Research, Formerly Assistant Professor of Biological Chemistry, Columbia University, Nutrition Officer, Camp Kearny, California, and Officer in Charge of Laboratory of Nutrition Army Medical School, Washington, D. C.; and HOWARD H. MASON, A.B., M.D., Instructor in Diseases of Children, Columbia University, New York, Associate Attending Physician to the Presbyterian Hospital, Attending Physician to the Ruptured and Crippled Hospital, New York. Second Edition, Thoroughly Revised. Philadelphia and New York: Lea & Febiger, 1921. Pp. xvi-703.

Practical Therapeutics

CONSTIPATION AND ITS TREATMENT.

By ARTHUR H. HOPKINS, B. S., M. D.,
Philadelphia.

There is probably no symptom more commonly encountered by the general practitioner than constipation. A review of our records will probably show that at least fifty per cent. of our patients complain of it, and in view of its far-reaching effects, other than the symptoms directly attributable to it, it behooves us to leave no stone unturned in the search for its cause and its subsequent correction. Constipation is a condition in which the feces are not passed sufficiently often, or in which defecation occurs daily but the movements are insufficient in quantity. As the normal amount of fecal material varies from 100 to 250 grams, depending on the type of diet, weighing the feces in questionable cases will frequently yield information of value.

SYMPTOMS.

In many cases there are no subjective symptoms; in many more there are sensations of fullness, tension, and abdominal discomfort. At times these sensations are referred to the stomach, as manifested by loss of appetite, belching, nausea, and disagreeable taste in the mouth. Coated tongue and headache are often present, while colicky pains and distention may occur.

It is to be recalled that constipation may occur with one or more daily stools and even diarrhea, a gradual accumulation of fecal material developing all the while. With fecal impaction there may be some escape of material around or through the mass, or at times the irritation of the mass may cause diarrhea.

ETIOLOGY.

To attempt to treat constipation without ascertaining the cause is futile. The first and most important step is to determine the etiological factor or factors, and, in order to do this, a careful history of the patient will throw much light on the subject. By inquiring into what food is taken at each meal, the amount of liquids, the habits of the patient, whether sedentary or active, the first guide for treatment may easily be obtained.

These factors are almost too well known to bear repetition but their repetition seems justified when we consider for a moment the enormous sale of cathartics and purgatives, legitimate and patent, which is carried on by the pharmacist and the manufacturing chemist of today. Let me further emphasize this point by referring to a single drug and showing you the combinations and preparations that commercial exploitation has done for it. I refer to phenolphthalein. Some of the twenty-seven varieties are: Alophen, cholelith pills, ex lac, laxophen, laxine, laxophalen tablets, phenalin, phenolax wafers, probilin prunoids, purgatol, purgella, purglets, purgo, purgolade, purgotin, veracolate and zam zam.

This camouflage for revenue is evidently successful and it will doubtless continue to be so until we

can do more to support the efforts of the medical profession in curbing the advertising of patent medicines in the newspapers and magazines of the country. We may render such support by the proper study of our cases and the refusal to prescribe cathartics when diet and other measures would cure, instead of protract, our cases of constipation. Of importance also is the prescribing of drugs by their official rather than their trade names.

To revert to the question of etiology, several factors deserve our consideration. These are best divided into two groups.

Group I includes actually diseased conditions in which constipation is a symptom, such as the following: 1. Diseases of the stomach, heart, lungs, liver, kidney, pancreas, brain, spinal cord and nervous system. 2. Acute febrile diseases and other diseases confining the patient to bed. 3. Obstruction of entrance of bile into the intestine. 4. Obstruction of the bowel by tumors, stricture, adhesions, and kinks. 5. Malformations, such as dilated colon and diverticula. 6. Enteroptosis. 7. Loss of power of abdominal muscles in emaciated and multiparous women.

Group II is composed of those conditions leading to so-called chronic constipation, the search for and correction of which is so essential for its proper management. Here we have to deal with impaired physiological functions, such as: 1. Retarded intestinal peristalsis, as atony or relaxation of the bowel. Intestinal stasis and enteroptosis may be included in the light of therapy. 2. Spastic constipation, perverted action or enterospasm. 3. Spasm of sphincter.

In short, chronic constipation may be divided into two classes, atonic and spastic. The causes of atonic constipation are: 1. Character and quantity of diet. 2. Lack of physical exercise. 3. Careless habits with regard to stool. 4. Irregularity in living—as traveling, etc. 5. Depressing emotions. 6. Enteroptosis associated with general atony and relaxation. 7. The abuse of cathartics or of large enemas.

On the other hand, the etiological factors underlying spastic constipation are: 1. Nervousness and hysteria. 2. Diseases of the pons and medulla, spinal meningitis and chronic lead poisoning. 3. Debility caused by long continued disease. 4. Sphincter spasm secondary to fissure or ulcer of rectum or reflex from inflammation in neighboring organs, such as the uterus and bladder.

TREATMENT.

This must of necessity depend upon the type, just as the type depends upon the etiology. Regardless of type, however, we have always to bear in mind that the efficiency of peristaltic movements depends upon the normal strength of the bowel muscles, the integrity of the nervous mechanism, the amount of residue in the intestinal contents and the character of the contents as solid, water, liquid, gas and bulk, which are variable in their production of irritation of the bowel. The gases, hydrogen, oxygen and nitrogen, are indifferent, while carbon dioxide,

hydrogen sulphide, and the volatile hydrocarbons stimulate activity.

Sansum calls attention to the three twenty-four hour periods required by the food to traverse the gastrointestinal tract of man. These are: First, to the hepatic flexure; second, descending colon below splenic flexure, and third, rectum and out. This holds for bed patients, but not, as a rule, for those who are ambulatory. He then shows how the type of diet may alter this passage. Probably the simplest measure for estimating the time required for the passage of food through the gastrointestinal tract, in a given case, is to administer a teaspoonful of powdered charcoal and observe the appearance of a black stool.

In the treatment of constipation associated with diseased conditions, as noted in the first group of etiological factors, little will be said here other than to call attention to the fact that the proper treatment of the underlying disease will do much to relieve the constipation. In the management of these patients great care should be taken to avoid rendering them chronically constipated during their illness by establishing the cathartic habit. Diet, water intake, massage in selected cases, the judicious use of an enema and the use of the proper cathartics, only when necessary, would seem to be the more rational method of treatment. Frequent irritating cathartics and purgatives, rendering the bowel more irritable and later more helpless as a result, are in a majority of cases inexcusable.

The daily morning dose of salts (magnesium sulphate, etc.) is insulting to the stomach as it both irritates the mucosa and delays the emptying time, frequently nauseating and depleting the patient and always irritating the intestinal mucosa. There are, of course, indications for salts in selected instances, but I have long felt that the practice was overdone and the indications far too frequently misinterpreted.

With regard to the management of the second group, i. e., chronic constipation, we will first discuss a few general measures. After eliciting the cause by methods mentioned above and eliminating all but the atonic and spastic types, and using the x ray as an aid to diagnosis of type, a hygienic method of living should be established in so far as it is compatible with the patient's occupation. If entirely incompatible, a change of occupation may be essential. Strain and worry should be relieved as far as possible. This holds for both types but especially for the spastic.

Training of the patient, as well as insistence upon cooperation, is very important. Allay anxiety and reassure the patient that if the bowels do not move for a day or so, no harm will be done. Regularity of time for stool at a time when free from hurry is very helpful. The use of a glycerin suppository or the injection of one to two ounces of olive oil by means of a small syringe may afford sufficient stimulation to start a movement and by so doing a normal habit may be reestablished.

DIET.

The human intestinal tract was planned at a time when coarse foods were eaten, while advancing civilization has furnished us with a more concen-

trated diet in which the smoother foods occupy the leading rôle. This change, coupled with sedentary city life, has produced a potent cause for the ever present complaint of constipation. While a part of the stool is composed of the bodies of living and dead bacteria, a part comes from the secretions of the alimentary tract and a far larger part consists of indigestible residue.

Grains eaten in the form of fine white flours and cereals, eggs, milk, cream, butter, fats, oils, meat, fish and sugars are all digested and absorbed and leave little if any residue and yet they form the major part of the diet for many of us. As an illustration, a dog, which on an ordinary mixed diet will have one movement a day, if fed entirely on meat will have one movement in five days. The same holds in starvation. The cell walls of plants are made up of cellulose which is indigestible and forms with the water, which it has the power of holding, the bulk of the normal stool. Bran which is nourishing, agar, vegetables and fruit contain the greatest amounts of cellulose.

Of the vegetables, spinach, cabbage, cauliflower and carrots produce stools nearly equal in amount to the vegetables taken, while fruits produce only about one fourth in bulk. Some of the cellulose in bran undergoes fermentation giving rise to gas and acid both of which are laxative. The dose, to be effectual, should be about two tablespoons twice a day, most pleasantly taken in the form of graham bread or other bakery products, and in purees. It is, of course, contraindicated in excessive digestion of cellulose and consequent flatulence, in gastric motor insufficiency, and in intestinal stenosis.

Agar agar, introduced by Schmidt, is a dried mucilaginous material which adds bulk and softens by retaining moisture. It is most useful where bran is not well borne and is of especial value in spastic constipation and mucous colitis. The dose is from two to four tablespoons used in cereals, in jelly, or added to cooked fruits, but not cooked with them. Olive oil in doses of one to two ounces is both nourishing and laxative; it lessens gastric acidity and retards motility. Its chief indications are spastic constipation, hyperchlorhydria, pylorospasm and peptic ulcer.

In summing up the diet for those patients where too little or too concentrated food has been the cause of the trouble, the introduction of green vegetables, fruit and the reenforcement, if necessary, of bran, agar or olive oil, will do much to relieve the disturbance. Water before breakfast and sufficient through the day should, of course, be urged.

PHYSICAL METHODS.

These are of use to strengthen the abdominal muscles and the bowel, to promote better action and to stimulate peristalsis directly. Massage for selected cases is excellent. Vibratory massage is warmly recommended by some, as is electricity. Gymnastic exercises as an adjunct should be mentioned, as should also hydrotherapy.

INJECTIONS.

Enteroclysis with hot normal saline solution at 110° to 115° for fifteen minutes, three times a week, is of use in obstinate cases, while colonic irri-

gation is valuable in colonic and cecal stasis. The soap and water enema is a simple and effectual measure and one useful, because unpleasant, when training a patient away from the constipation habit. A patient who will use this every third day, or when necessary, instead of using a cathartic, will, as a rule, be particularly careful in carrying out the routine treatment. Klemperer recommends the injection of half a pint of water into the bowel at bedtime, the patient being told to retain it, while Kussmaul and Fleiner employ an injection of sweet oil in the same manner. The amount is gradually increased to eight ounces and is very useful, especially in cases of spastic constipation.

ORTHOPEDICS.

For cases of enteroptosis the abdominal support of one form or another is one of the most valuable measures at our disposal.

DRUGS.

These are mentioned last, because I believe they should be the last to be considered in probably the majority of cases of chronic or habitual constipation. Kemp generally starts the treatment with laxatives, training the patient as to regular habits, etc., and gradually reducing the dose. This, it must be admitted, is in some cases a very useful method. By means of the x ray we are gradually discovering the selective action of certain drugs for certain portions of the intestinal tract, and with further advances in this line more accurate medication will be attained. I refer to the action of podophyllum on the duodenum and aloes and senna on the colon.

Of the more important cathartics a word before closing. Castor oil is comparatively nonirritant and reliable and the quantity of oil that exceeds the digestive capacity is passed through unchanged. It can be so refined as to render it free from smell and taste if protected from the air. Liquid petrolatum is harmless, as a rule, and has its particular usefulness in spastic constipation and in stasis. It lessens irritability, softens feces, but has a tendency to leak. Many varieties are on the market, but by ordering the U. S. P. variety the patient will be saved expense. There is little difference in action between the light and heavy kinds. Cascara in proper doses is exceedingly useful. Senna acting upon the large bowel, is useful in completing the action of a duodenal purgative, such as the mercurials or podophyllum. Rhubarb, the so-called constipating purge, is irritant and has the greatest tendency to succeeding constipation.

I have touched briefly upon some of the most useful cathartics, but it has been my purpose to deal with the treatment of chronic constipation and with that end in view cathartics have been relegated to their proper place, namely, the background. There is no doubt in my mind that there are many types of constipation, as mentioned in the first part of this paper, which call for the judicious use of cathartics, but their discussion lies beyond the scope of this paper.

Permit me to emphasize two points in closing and they are, first, cathartics should not be used where other measures will suffice, and secondly, purges should not be used where laxatives will do.

1726 PINE STREET.

A NEW DUODENAL TUBE FOR THE STUDY AND TREATMENT OF DISEASES OF THE DUODENAL AND BILIARY PASSAGES.

(Preliminary communication)

By L. WINFIELD-KOHN, M. D.,
New York.

The important rôle that the duodenum plays in disease of the alimentary tract impels every student of gastrointestinal disturbances to centre his attention upon this organ and the neighboring biliary apparatus whenever patients complaining of symptoms of indigestion present themselves for study.

Disease of the duodenum is of rather common occurrence; in fact, many regard the duodenum as being the seat of ulcer more often than the stomach. It may also be emphasized that diseases of the gall-bladder, gallducts, liver and pancreas are more common than many of us have suspected. The reason why affections of these organs have been found so frequently within recent years is that our methods of investigation of the duodenum have become more practicable and efficient, in consequence of which diseased conditions are more readily recognized. It would be unreasonable to suppose that diseases of these organs were less prevalent in former years, but it would seem logical to presume that because of our lack of knowledge at that time many of these ailments were overlooked.

When we consider the relationship of the duodenum to its neighboring organs from anatomical and physiological viewpoints, we can readily appreciate the reasons for the formation of disease at this site. We can readily understand the possibility of a transference of disturbance affecting the many functions of the stomach to the duodenum. The results of disturbed gastric function such as hypersecretion or hyposecretion or disturbed motility may in many instances contribute to the creation of duodenal disease. In a similar manner we can presuppose the establishment of disease of this organ from primary disturbance in the adjoining organs of the biliary system, and we may also assume that primary disease in the duodenum may cause disease in the organs of the biliary tract.

We cannot dispute the fact that the duodenum is open to the development of disease from other sources through the blood or lymphatics as mediums of conveyance. This same process of reasoning applies to disease in the organs of the biliary system. The more or less constant abuse inflicted upon the organs of alimentation through dietary indiscretion also invites disease of the duodenal mucosa. Mechanical interference, as in instances of high fixation of the duodenum by the ligament of Treitz while the rest of the small bowel and stomach are profoundly ptosed, will also encourage duodenal disease. Excessive chemical stimulation of the duodenal mucosa by hypersecretory gastric material may also incite disease of the duodenal lining, and the same may be said of irritation by the pancreatic and biliary secretions.

Now that we have admitted the frequency of duodenal disease and appreciated the reasons for its occurrence, we also immediately become impressed

with the great need of recognizing the disease or disturbance when it exists. Many mechanical contrivances, such as the Einhorn, Jutte and other tubes, have been devised for the purpose of rendering this cavity accessible to study and treatment. Palefski recently laid stress upon the use of the duodenal tube for the purpose of outlining the duodenum. Lyon came forth with his method which aims at a better understanding of the pathology of the biliary system and which consists of introducing magnesium sulphate solution into the duodenum, in consequence of which the sphincter muscle at the papilla of Vater relaxes and biliary material enters into the duodenum.

The new tube that is introduced here has been designed with the object of isolating the duodenum from the remainder of the alimentary tract. By temporarily separating this portion of the tract from the remainder of the bowel and stomach, certain detailed studies can be carried out that are otherwise impossible. As a result, the duodenum and its contents are under our immediate control, and although as a result of the temporary isolation there may be some slight interference with duodenal or gastric physiological activity, I hardly look upon such disturbances as objections to the use of this instrument. Of course, further experience with the use of this tube will bring out both its good and bad features.

The instrument consists of a hollow tube which embraces in its cavity two separate hollow tubes of decidedly smaller calibre and a columnar hollow space. The tube is widest down to its pyloric mark and below this point is much narrower, owing to the fact that from here down it contains only two avenues of communication. The lowermost avenue communicates with a rubber bag that can be sufficiently dilated with air to approximate the circumference of the duodenum, thus cutting the duodenum in its lowermost or distal portion off from the rest of the bowel beneath. Above, at a certain point corresponding to a position within the stomach just above the pyloric ring, another air bag arrangement exists, to be ballooned out so as to hug the circumference of the lowermost pyloric part of the stomach just proximal to the pyloric ring; or, if this bag also is allowed to pass into the duodenum, it may be blown up and drawn upward so as to hug the duodenal side of the pyloric ring. Between these two outlets, within the duodenum, a small opening in the tube communicates with the duodenal cavity, and through this opening the duodenal contents can be aspirated or, instead, the duodenum can be filled. Above, outside of the mouth, we can connect with each tubal compartment separately. Both air spaces may be filled with air while the duodenal space is managed according to our judgment. The tube in its widest diameter is quite small and slightly longer than the ordinary duodenal tube, and is marked off so as to give us an idea of its position in the digestive tract. Slight improvement from time to time may render this contrivance still more serviceable. By an elongation of the distal end of the tube we may be enabled to make studies of the jejunum and the gastrojejunal communications of gastroenterostomy patients.

Another similar tube arrangement, devoid of air bag attachment near the pylorus, has also been made, and with this I am also making studies of the duodenum. I am looking into the effectiveness of the pyloric contraction about the tube without the use of the supportive closure influence of an inflated air bag at or above the pylorus.

Both of the tubes described above are modifications of the duodenal obturator and sectional intestinal examiner tubes, described by Einhorn (1) but not advocated by him for study in the same detail as indicated below. To Einhorn, however, belongs the credit of having first delved into the innermost recesses of the smaller bowel.

By thus isolating the duodenum, numerous possibilities for the use of this instrument loom forth very forcibly.

1. Its greatest immediate use will probably be for studying the outline of the duodenum in its entirety and the nature of its association with the stomach through fluoroscopic or radiographic methods. By more adequately filling out the duodenum, our knowledge of the anatomy and physiology of the duodenum may in the future become considerably enhanced. By the process of alternately cutting off and supplying air to the rubber bags at estimated intervals, the motor activity of the duodenum or jejunum may be better appreciated. The effect of muscular contraction upon the artificial air bubbles may lead us on to some conclusions, and the employment of both the prone and upright positions during the course of the examinations may also aid in clarifying matters.

2. We may even contemplate going a step farther, since we feel that we can relax or open Oddi's sphincter at the papilla of Vater and make an effort to fill up the gallducts and pancreatic duct with either air or a harmless yet impenetrable rendering solution so that by shadows the x ray may delineate the biliary system and pancreatic ducts. By filling up the duodenum above the blockade it may be possible to dam such a solution back up through the previously relaxed sphincter.

3. From the viewpoint of biliary system study, we may, through isolation of the duodenum, gain a better idea of the true effect of magnesium sulphate and other medicaments upon the biliary tract. A more adequate appreciation of the amounts of bile eliminated, the quality of the biliary and pancreatic secretions and the pathological elements present in these parts will be attained.

4. More satisfactory means of directly applying medication to disease in the duodenum may be practised, and the treatment may be continued in an uninterrupted manner for a period long enough to obtain better results from the viewpoint of healing effect upon ulcer, inflammation, etc. The probability of directly treating diseases of the bile tract through this contrivance does not seem remote.

5. By employing a tube, the distal portion of which is prolonged, studies may be made of the gastrojejunal stoma and of lesions at this area, especially through fluoroscopic and radiographic means.

6. With this tube as a medium, we are now attempting to gather direct evidence of conditions existing within the duodenum, pancreatic and biliary

tracts in a manner that has never been employed before to our knowledge.

I am greatly indebted to Mr. A. E. Pfarre for his kind suggestions and valuable aid toward the development of these instruments.

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768 WEST END AVENUE.

SIMPLE METHOD OF REFILLING CONTAINER FOR ADMINISTERING FLUIDS.

BY JACOB BUCKSTEIN, B. S., M. D.,

New York,

Consultant in Gastroenterology, U. S. Public Health Service.

This container consists of a nonbreakable vacuum bottle, a thermometer and a graduated gauge. The vacuum bottle conserves the temperature of the contained fluid. The thermometer is so arranged as to register the temperature of the fluid as it makes its exit. By means of the graduated gauge, the level of the fluid within the opaque container can be determined, and also the rate of flow. The container

connected and at its end a glass tube with funnel shaped top is inserted. The tube is approximately the length of the container. The fluid may then be poured in from the flask. The level of the fluid within the container will rise to the same height as the level of the fluid within the glass tube. After the container has been filled to the desired level, the glass tube is removed and the rubber tubing reattached to the projection. By releasing the clamp the fluid will again flow through the rectal tube.

Continuous or even intermittent proctoclysis is thus simplified, through the easy manner in which the container may be refilled. The same principle may be employed when the apparatus is arranged for the administration of fluids intravenously, by hypodermoclysis, and for administering irrigating fluids.

Treatment of Mucous Colitis.—G. P. Hamner (*Virginia Medical Monthly*, March, 1921) recommends daily colonic lavage with a solution of sprudel salts as the best measure for removing mucus and relieving toxemia in this disorder. To this may be added, on occasion, large doses of castor oil by mouth to facilitate passage of the mucus. The enemas should be taken with the patient on the left side and hips elevated slightly higher than the shoulders, and the solution should be as hot as can be comfortably borne. Transduodenal lavage with four per cent. sodium sulphate solution has been used of late with reported success. There should be insistence on regularity of bowel movements, but overuse of enemas and colon irrigations is to be forbidden. The diet must be ample. Use of bran, coarse foods, and too much fruit should be discouraged at the start, a mild laxative agent such as liquid petrolatum, cascara agar, phenolphthalein agar, or small doses of magnesia being preferable. If these do not suffice, cascara, rhubarb, aloes, senna, or compound licorice powder may be added. Retention overnight of four to sixteen ounces of cottonseed or olive oil is also valuable. If, after long and faithful trial, these measures fail to overcome stasis and toxemia, surgical treatment is to be seriously considered. Where hemorrhoids interfere with treatment, nightly instillation into the rectum of sixty mills of warm olive or cottonseed oil with a soft rubber ear syringe is advisable, but only until the patient is able to have them removed surgically. The diet should, at the outset, generally be of the bland, lactofarinaceous type. Coexisting appendicitis, cholelithiasis, adhesions, bands, or pelvic disturbances should be surgically corrected. Occupation, recreation, and rest in proportions should be advised and introspection strongly discouraged. Change of scene is of great help. In attacks of colic, the indications are to relieve pain and neurotic symptoms and promote evacuation of mucus. The measures appropriate are rest in bed, one half to one dram of bromide, a hypodermic of atropine, the hot water bag, electric pad stupes, morphine very carefully, a large dose of castor oil, and colon irrigations with warm soda solution. A combination of castor oil by mouth, codeine and atropine hypodermically, and colonic lavage is often followed by relief and sleep.

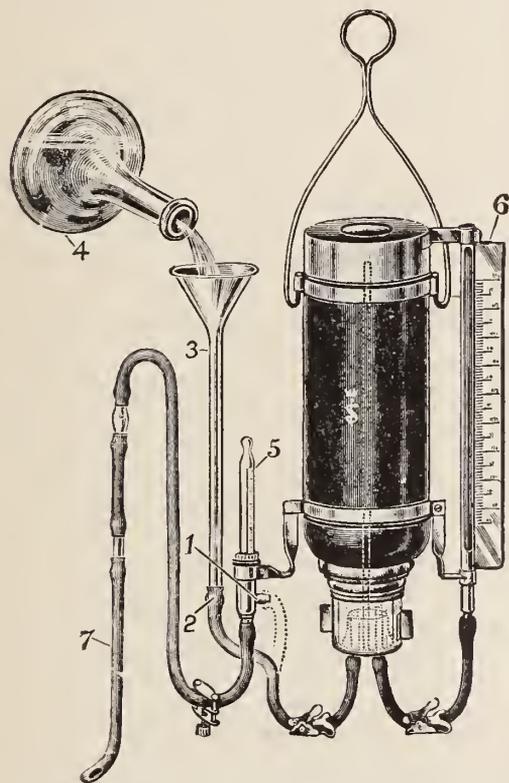


FIG. 1.—Container for administering fluids. 1, Hollow projection piece; 2, end of rubber tubing detached from 1; 3, long stemmed glass funnel; 4, flask; 5, thermometer; 6, graduated gauge; 7, rectal tube.

has the capacity of approximately one litre. After it has been emptied of fluid, I have devised the following simple method of refilling it, as often as may be desired, without the necessity of inverting the container, and removing the cover and stopper.

Ordinarily the piece of rubber leading from the fluid outlet tube is attached at the projection marked I, as indicated by the dotted line in the accompanying cut. In refilling, this piece of rubber is dis-

Proceedings of Societies

AMERICAN GASTROENTEROLOGICAL ASSOCIATION.

Twenty-third Annual Meeting, Held in Atlantic City, N. J., May 3 and 4, 1920.

Dr. FRANKLIN W. WHITE, of Boston, First Vice-President and Acting President, in the Chair.

President's Address.—In the absence of the president, Dr. Thomas R. Brown, of Baltimore, Dr. Franklin W. White, of Boston, the first vice-president, delivered the annual address.

Diaphragmatic Hernia Diagnosed During Life.—Dr. MILTON M. PORTIS, of Chicago, said that only a small number of these cases were diagnosed during life, most of them being found at operation or autopsy. The cases were either congenital or acquired, trauma being a factor in the latter—especially war injury—and were not so rare as was ordinarily believed. These hernias most frequently occurred in the congenitally weak places in the diaphragm, and they occurred fifteen times as often on the left as on the right side, this probably being due to the protective action of the liver. The organs most commonly found in the hernia were the stomach and colon. At times, however, the small intestine, the liver, spleen, and all the mediastinal viscera might be found in the hernial sac. There were no pathognomonic symptoms. In some cases the symptoms pointed to the gastrointestinal tract, and in others the symptoms pointed to the chest. The symptoms, he said, depended upon the size of the hernial protrusion and its location. When the hernia was large, one found tympany where there should be lung resonance; or, when there was fluid, one found dullness where resonance should be. The diagnosis was largely made by the x ray. The fluoroscope made it possible to demonstrate the condition easily. For the radical cure of these hernias, surgery was the only method of treatment. Small hernias that gave no symptoms required no treatment. In mild cases, the treatment might be purely palliative, along simple lines. When, however, the symptoms were persistent and resisted ordinary medical measures, there was only one treatment—surgery.

Dr. SEYMOUR BASCH, of New York, said that Dr. Portis had correctly stated that the diagnosis of diaphragmatic hernia had advanced considerably in the last decade, mainly through the aid of the x ray, and, probably from the fact that increasing knowledge had directed attention to its recurrence, more cases had been discovered, and not because the condition was of greater frequency than formerly. Previous to the use of the x ray, the diagnosis had sometimes been made during life by clinicians, and, of course, it was considered a condition of great rarity.

The diagnosis of diaphragmatic hernia was very easy in modern times, as hinted by Dr. Portis, when one had a pronounced, an extreme case; but when there was a small hernia, such as might be produced

by a stab or a pistol wound, or by spontaneous rupture of the diaphragm, the difficulty was much greater, and could be made only through repeated and careful examination.

The two points that were important to remember regarding x rays were that, while one saw the upper line of the stomach, it was not, as Dr. Portis pointed out, the line of the diaphragm. The line of the diaphragm in a true hernia was broken, and one got the contrast with the other side by comparison. The line of the stomach was a large, pronouncedly white line, and could be diagnosed readily, even without the stomach being filled. A second point of importance in the differentiation between either the relaxation of the diaphragm in congenital conditions and true hernia was that in watching the fluoroscope and having the patient breathe deeply, the abdominal organs, in true hernia, usually moved upward; whereas, in congenital relaxation, the respiration pushed them down. From the x ray viewpoint, this was more important through the fluoroscope than through the x ray plate, because with the fluoroscope one could, by changing the position, notice the line of fluid and see the organs almost as well as with the plate. Among the physical signs there were two or three that were of importance, one of which was not mentioned by Dr. Portis, namely, displacement of the heart. Almost all of these hernias were on the left side, and, as a result, the stomach being prolapsed, the heart was pushed to the right.

Elevation of the Left Diaphragm.—Dr. FRANKLIN W. WHITE, of Boston, presented lantern slides of an unusual case of elevation of the left diaphragm (eventration), with inverted stomach, stomach, as part of the discussion on Dr. Portis's paper on hernia. The patient was a man sixty years old, a typical club man, well preserved and goodlooking; he had used alcohol freely, and had been free from gastrointestinal symptoms until about a year and a half ago, the sole exception to this being that if he ate a big dinner, he almost invariably vomited it up. The other unusual thing about the case was that during the last ten years the patient habitually gulped up some fluid about ten minutes after a meal. In the past eighteen months he had had several serious attacks of gastric pain, and had had two serious hemorrhages from the stomach. Several x ray plates of the patient's stomach were presented, one of the most important showing the extreme differences in the position of the stomach at different times. Dr. Portis found that when the patient had his worst attacks, the stomach was above the diaphragm, and that when it was going along relatively well, the stomach was three fourths below the diaphragm. He also got it in several intermediate positions.

Concerning the diagnosis, he said the important thing was to distinguish it from a highsided left diaphragm, which he thought was a better term than eventration. The highsided diaphragm was not

a surgical condition; eventration was. Physical signs did not distinguish the two things. One got the splashing associated with air in the lower part of the chest in both conditions, and could make the clear diagnosis only by x ray examination. Some things had been put down as diagnostic that were not of great value, in his opinion. Respiratory movement on both sides did not help in distinguishing high-sided left diaphragm from hernia. The hernia might move up and down and the diaphragm might be immobile. The movements must be equal with respiration and must be in the normal direction. The domeshaped line was considered characteristic of the left-sided diaphragm. In the right kind of hernia, one got a symmetrical domeshaped line, even in hernia. The so-called paradoxical respiration, the right side going down and the left going up, was not a good sign, because it was too rare to be a good diagnostic sign.

Diagnosis and Treatment of Recurrent Cholecystitis.—This paper was by Dr. MAX EINHORN and Dr. WILLY MEYER. Dr. Einhorn said he would not give in full his portion of the paper, but would pick out only a few points to discuss. He said that there existed two types of chronic cholecystitis, 1, those with symptoms of a distinct biliary colic, and, 2, those with definite abdominal disturbances. A diagnosis of chronic recurrent cholecystitis could frequently be made, even when stones were absent, by the symptom present, in conjunction with a direct examination of the bile. When, in such case, he found turbid bile, he operated. When operating for cholecystitis, a chronically diseased gallbladder should be excised, even if no stones were found in the affected organ. If the contents were found to be turbid, the gallbladder should be rejected. In those cases of cholecystitis where there was protracted fever and in which there was a leucocytosis and perhaps a polynuclear increase, operation should be performed, especially if the bile in the duodenal contents was found to be turbid.

As regards the treatment, there was no doubt about the thoracic method's being better for the repair of the hernia; but it had one drawback, and that was that it was impossible to inspect the abdomen and see whether there was any injury to the organs. Many operators use both: the thoracic first, and later through the abdomen below. A surprisingly large number of good results had accrued in the last six years from operative procedure, compared with the previous lamentable results.

Dr. Meyer discussed the subject from the viewpoint of the surgeon. He said that whenever a case of recurrent cholecystitis was presented for treatment, one naturally thought of the stomach, the duodenum, the pancreas, the gallbladder, and frequently the appendix or the kidney. Other abdominal troubles often arose. So far, it had not been found, since the introduction of the x ray and the cholesterol treatment, that the findings had greatly improved the means of diagnosis, although progress had been made in that respect. Nearly fifty per cent. of the cases showed stones in the gallbladder, but he did not believe that at that time the x ray was able to show a nondistended, nonthickened gallbladder on the plate. Cholesterol had been found

to be unreliable as a method of diagnosis. When asked to operate in such cases, an examination of the duodenal contents had been made. In every case in which the gallbladder cannot be felt and the symptoms do not point to gallstone colic, examination of the duodenal contents was pretty nearly sure to reveal turbid bile, cholesterol, bilirubin, etc., even if no stone was found at operation. Dr. Einhorn had preserved the turbidity and the color of the bile artificially, so that one might compare it with the findings during operation. Naturally this could be done only by aspirating the gallbladder. While aspirating, greenish black and brown turbid bile had been found, which, up to the present time, had been considered as an indication for the removal of the gallbladder.

Dr. Meyer found, in cases where operation was refused for one reason or another, that the symptoms recurred eventually and for the patient's lifetime, up to the time that the gallbladder was removed. Reports of sterile bile in such cases had been received frequently, and one had begun to ask whether the right thing was being done. On thinking of what might produce the sterile bile, one realized that bile of itself would, in a little while, destroy the contained microorganisms. It was an anaerobic condition. The laboratories made their studies not in an anaerobic way. Then there might be a certain number of bacteria in the bile at times, and at other times none; the bit of bile examined might contain bacteria, and other portions of the bile, none.

The second question was, How does normal bile in the gallbladder really appear? In other words, was a greenish black or brown bile, slightly turbid, always anaerobic? He believed that it was, because since they had started they had adopted the following procedure in their investigation: the instant the person in the laboratory received the bile from the gallbladder which had been operated upon, he spread it out on the bouillon, at the operating table. He then bisected the gallbladder transversely, using the lower portion and the cystic duct for culture and the upper portion for pathological examination. In the majority of their cases, they had found that the gallbladder wall, as such, contained the bacteria; and they recognized the fact that these bacteria might now and then enter the bile and reinfect it. They considered this an indication for removal, because they could not see how such a gallbladder could, by internal means, recuperate itself. It had to come out. Therefore, it was thought that cholelithiasis was a more frequent disease than heretofore considered.

With the x ray they could exclude gastric and duodenal ulcer, where it was shown that the pancreas was discharging normal ferments; but they found this turbid bile with cholecystitis, without stone. It was more common in the male than in the female. Women almost always had the stone in connection with the cholecystitis. In one case they found a stone that had ruptured the gallbladder so that the bile was running down from the liver. A condition like that, this method could not show; but it could show turbid bile.

(To be concluded.)

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NEW YORK, WEDNESDAY, SEPTEMBER 7, 1921.

Miscellany.

Cholecystostomy and Cholecystectomy.—Frank D. Moore (*Surgery, Gynecology and Obstetrics*, July, 1921) asserts that we may summarize the end results of cholecystectomy as compared with those of cholecystostomy as follows.

In general, cholecystectomy is the operation of choice in all cases, except where general debility, serious complications, such as abscess, peritonitis or previous extensive adhesions make removal too dangerous or prolonged an operation. In these cases, cholecystostomy with possible later cholecystectomy, may be done with advantage. It has been proved by numbers of cases and observations by various authors, that a removal of the gallbladder is not, in itself, detrimental to the future health and well being of the patient. Why, then, permit the patient to face the risk, not only of possible, but of probable recurrence of trouble, with the necessity of a future second and more difficult operation, when, in the hands of a careful surgeon, a total removal of the offending organ may be done with but slightly greater expenditure of time and with but little more immediate risk to the patient?

Judgment in the selection of cases for removal, early diagnosis and early operation, all make for the choice and ultimately vastly more satisfactory results of cholecystectomy. The value of this method of treatment for appendicitis is unquestioned, and it seems as logical to follow this same procedure in the case of a similarly affected gallbladder. A diseased appendix is obviously of no use and is manifestly a source of danger. Is not a functionless and diseased gallbladder to be regarded in the same light? The diseased gallbladder has also come much into the limelight, of recent years, as a focus of infection for various forms of arthritis, anemias

and general constitutional disturbances, and many removals of the gallbladder have been followed by marked improvement in the general bodily metabolism and welfare. It would seem, then, that cholecystostomy may well be regarded only as a makeshift or temporary resort, where conditions are such as to contraindicate the performance of a truly remedial operation, and that cholecystectomy may be accepted as the operation of general choice.

Foreign Bodies as a Cause of Appendicitis.—S. A. Mahoney (*Boston Medical and Surgical Journal*, February 3, 1921) has made quite a study of the literature on this subject, and finds that pins are the foreign bodies most frequently found in the appendix. The cases are rare, only forty pins in 160, or possibly 228 years, if the case of Ruysch in 1691 is considered the first. Only eighty-six cases of true foreign bodies were found in the literature. Cases of true foreign bodies range from 0.2 per cent. to 12 per cent. among American observers, while foreign observers make the percentage higher—as high as fifty per cent., probably because they classify fecal concretions as foreign bodies. The pin generally lies quiescent in the appendix for a long time, and the attack causing operation generally is acute. The pin may enter by head or point, and lie transversely or parallel to the axis of the appendix. The appendix is generally perforated by the point of the pin and abscess formation is generally present, with metastatic abscesses of the liver rather common. Pins occur more often in males than in females, and most frequently in children under ten years of age.

Chronic Afebrile Appendicular Jaundice.—C. P. Caplesco (*Bulletin de l'Académie de médecine*, March 29, 1921) describes an afebrile chronic jaundice of mild grade due to toxemia from unrecognized disease of the appendix. The patients suffer from digestive disturbances of various sorts, such as epigastric pain and weight after meals, capricious appetite and irregular digestion, and sometimes nausea; other patients are constipated and suffer from migraine. The icteric condition is marked merely by a varying degree of discoloration of the conjunctival cul-de-sacs, associated occasionally with a yellow color of the bulbar conjunctiva. Careful examination of the region of the appendix in over fifty cases revealed tenderness in this area. By beginning the examination of his patients with a search for this discoloration of the conjunctiva, or conjunctival sign, the author has been led to detect appendicitis in individuals who did not suspect that they had any appendiceal trouble. In all cases subjected to operation on the basis of the conjunctival sign obvious appendiceal disease was found—e. g., an enlarged, congested appendix containing bloodstained material or fecal matter, calculi, and parasites, with constant dark areas and ulcerations of the mucous membrane beneath such foreign bodies and a fibrous thickening of the submucous layer. The discoloration of the conjunctivæ is ascribed to toxic material formed in the diseased appendix, absorbed and carried to the liver, where it causes enough disturbance of the hepatic cells to induce a mild toxic icterus.

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WHOLE No. 2217.

Pseudotabetics and Their Reeducational Treatment

By PIERRE KOUNDJY, M. D.,
Paris,

Late Chief of the Reeducation Services at the Salpêtrière, and of Physiotherapy at the Val de Grâce.

It is often simple enough to mistake a pseudotabetic for a genuine case of tabes, for the symptomatology in both instances is frequently very similar. Thus one finds incoordination of movement of the lower limbs and ataxia of the upper, Romberg's sign, absence of patellar and Achilles tendon reflexes, anesthesia, analgesia, delayed transmission of impulses, lightning pains, gastric crises, visceral crises, amblyopia, muscular pains, and, occasionally, a disturbance of the reaction of the pupil. These symptoms may be encountered in pseudotabetics, either isolated or in groups of two, three or several signs together, and thus suggest the presence of a true locomotor ataxia of Duchenne, of Boulogne. Occasionally, this similarity extends even to a confusion in the findings of morbid anatomy. Thus, Tuzek, of Vienna, has published reports of four cases of pseudotabes with records of autopsies and serial sections of the spinal medulla, in which one can trace sclerosis of the whole length of the posterior columns similar to the lesions in true tabes.

In spite of this, pseudotabes is a pathological entity easily distinguished from true tabes on account of its etiology and, especially, of its course. According to Professor Déjérine and Dr. Thomas pseudotabetics are characterized by their tendency to complete cure, by tenderness on pressure of muscles, and by the absence of the Argyll Robertson pupil. Further, they can be distinguished by the different topographical distribution of anesthetics, "which here diminish from the distal end towards the root of a limb, whereas in tabes they always show a radicular distribution" (1).

Professor Déjérine, who published his first two observations on pseudotabes in 1882, has termed this affection neurotabes or peripheral tabes, thus indicating the polyneuritic origin of the disease. We have noted above that even medullary lesions may exist in cases of pseudotabes, as demonstrated by the observations of Tuzek. There are also varieties of pseudotabes which show at the same time medullary and peripheral lesions, such as in those due to diabetes. In the majority of cases pseudotabetics also present psychic disturbances in

the form of phobias in addition to two or three signs of tabes, such as Romberg's sign, lightning pains and disturbances of sensation, or the loss of reflexes. The dominating obsession is the morbid fear of walking. Basiphobia is the psychic element characteristic of pseudotabetics.

Further, there are the phobia of space, agoraphobia, and the fear of standing alone and unsupported, stasiphobia. We have known a pseudotabetic who, on finding herself suddenly isolated from the crowd with which she had been crossing the entrance hall of the Saint Lazare Station, experienced great difficulty in walking. When surrounded by people, she could manage to reach the platform, but when isolated, she could not move and had to wait for the propitious moment when she could join the company of others, before she was able to continue on her way. It has to be noted in this connection that the same psychic condition may be encountered in cases of true ataxia. However, in the latter it assumes a graver aspect, for this complication considerably increases motor incoordination and finally renders progression quite impossible.

It has been stated that the motor incoordination of pseudotabetics does not resemble the locomotor ataxia of Duchenne, of Boulogne. Nothing could be more inexact. Though in some cases of pseudotabes the motor incoordination approaches the type of polyneuritic ataxia, characterized particularly by "steppage," yet, in the majority of cases it is, so to speak, a copy of the ataxia found in true tabes. The walk of pseudotabetics is precipitated, jerky, staggering, hesitating, and spasmodic in a fashion equal to that of a good many true tabetics. These manifestations show the closest resemblance in the case of a pseudotabetic whose symptoms suggest an early stage, or the first degree of locomotor ataxia. There we find the same inequality of steps and the same absence of rhythm in the walk and the unilateral predilection of spasms. Dr. Berbez has reported a very curious case of false tabes with severe motor disturbances of the upper limbs. "The patient was unable to carry to his mouth a glass filled with water without spilling the contents" (2). Quite recently Professor Déjérine presented at his

interesting Tuesday demonstrations a girl, eleven years old, who suffered from peripheral tabes of infectious origin, probably diphtheria. She was affected at the same time with pronounced motor disturbances of the upper limbs, diplopia, and very extensive sensory changes.

The motor disturbances of the lower limbs may become so troublesome in pseudotabetics that they are rendered quite helpless. Fourteen years ago, at Charcot's clinic, we had under our care a pseudotabetic with complete lack of control of the legs. The patient was confined to his bed for four months without being able to hold himself upright for an instant. However, reeducation exercises trained the patient to walk well and unsupported at the end of a month's treatment. In Dr. Berbez's case the paraplegia of the lower limbs was complete. Thus, motor incoordination of pseudotabetics may present all the phases of tabetic ataxia ranging from commencing to final paralytic ataxia.

Romberg's sign is the second symptom of tabes dorsalis which is found again and again in pseudotabetics. Incidentally, it may be mentioned that the pseudotabetic usually discovers the presence of his illness by the impossibility of standing upright in the dark or with his eyes closed. This sign is rarely absent, and, whatever the cause of the pseudotabes, it can be noted with ease. Occasionally, it is necessary to let the patient stand on one foot in order to demonstrate it clearly.

The pains in pseudotabes differ in character from the lightning pains of true tabes. They seldom occur in the form of regular crises, and, often, they are only of short duration. They may be localized, as in true tabes, in the lower limbs, in the chest, or they may assume the form of unilateral or bilateral sciatic pains. Sometimes they persist for long periods. The chief characteristic feature, however, is their complete cessation with the disappearance of the other tabetic symptoms.

The sensory disturbances in false tabes also differ from those found in true tabes. They have an irregular topography, being localized sometimes in one limb, sometimes in both at the same time, but only rarely do they present the symmetrical form shown by the sensory affections in true tabes. They are situated distinctly at the periphery and diminish steadily as the root of the limb is reached. They are, therefore, differentiated from the sensory disturbances of true tabes by the absence of the radicular arrangement. In a few instances one meets with plantar anesthesia and the "cotton wool sole" of the tabetic.

Delayed transmission of impulses is a relatively frequent phenomenon in pseudotabetics, especially if neurasthenia is present. Absence of the patellar reflexes is not a constant phenomenon in pseudotabes, but in many cases it exists together with Romberg's sign and motor incoordination. In other cases one finds, on the contrary, that these reflexes are exaggerated. Generally speaking, return of reflexes is the rule here, whereas their abolition is permanent in cases of tabes dorsalis. The gastric and visceral crises of pseudotabetics have not the same severity as in true tabes; they are never continuous. Among the visual disturbances of pseudotabes

diplopia is only rarely met with; and, if it does exist, it is only partial and often very faint.

It is clear from the preceding that cases of pseudotabes may occasionally resemble so closely cases of tabes dorsalis, especially when locomotor ataxia exists, that confusion may arise in spite of all endeavors. However, if investigations are persisted in with patience, one cannot fail to establish the correct diagnosis of the affection. This has called forth the statement by Professor Raymond in his masterly dissertation on the Diseases of the Nervous System, that pseudotabetics are differentiated from true tabetics by the evolution of the symptoms, the rapidity of their development, and their usual curability. In fact, a pseudotabetic recovers always and in a very short time, relatively speaking. Relapses may occur and the same manifestations recur as before, but in the end a definite and complete cure is effected. A true tabetic may improve, often to a notable extent, but he will always retain the stigmata of the affection for his whole life.

Among the etiological causes of pseudotabes we may quote intoxications, such as alcohol, lead, copper, arsenic, nicotine, carbon bisulphide, ergot, and diabetes; infections, such as diphtheria, smallpox, scarlatina, syphilis, and dysentery; hysteria, neurasthenia, overwork, and exposure. There are also cases of pseudotabes of obscure origin. The list given above makes it unnecessary to discuss each etiological form of the disease. We shall only deal with syphilitic pseudotabes, for syphilis may be the cause of this affection, just as it is responsible for the great majority of cases of tabes dorsalis. Lamy (3) in his remarkable work on syphilis of the spinal cord, presents the observations of several authors on cases in which cerebrospinal syphilis represented the clinical picture of pseudotabes, identical with that of tabes dorsalis, with ocular paralysis, lightning pains, visceral crises and incoordination of progression. This author also quotes a similar observation of Fournier and Dieulafoy in a case of tabes where the symptoms of cerebrospinal syphilis were manifested by gradual paralysis of the lower limbs, lightning pains, loss of patellar reflexes, and disturbances of progression; in other words, by the phenomena of syphilitic pseudoparalysis.

Claude reported to the Neurological Society in 1908 the case of a man, forty-one years old, who had acquired syphilis five years previously. Four years before examination the patient experienced weakness in his lower limbs and marked lightning pains. Under the influence of mercury, prescribed by Claude, the latter symptoms disappeared completely. A few months later difficulties arose in the control of micturition. On examination Romberg's sign, recurrence of motor incoordination, and paresis of the lower limbs were discovered. The patellar reflexes were present, and the pupils were normal. A second vigorous mercurial treatment was instituted and, once more, all symptoms disappeared. The patient died two years later of phthisis. At the autopsy a few strands were found to be affected with syphilitic meningitis and with slight medullary degeneration; however, no trace of a lesion of the posterior cords could be discovered. Undoubtedly then, this was a case of syphilitic pseudotabes.

We have seen above that two causes are necessary for the production of pseudotabes: 1, the true etiological cause, such as intoxication or infection, and 2, the predisposing cause—the psychic condition of the patient. Pseudotabetics are above all neurotics, a fact explaining to a certain degree the characteristic aspect which tabetic symptoms assume in these cases. This further serves to explain the rapid development of the illness as well as the complete cure and the disappearance of symptoms.

The therapy of pseudotabes must, therefore, be divided into two groups: the first aims at removing all causes of intoxication, infection, or overstrain. The patient should be placed under the best hygienic conditions and submitted to an appropriate dietetic régime, and all therapeutic means should be applied, which act internally on the specific causative agent: potassium iodide, arsenic, mercury, benzonaphthol, aspirin, etc. The second group comprises all external measures, or, in other words, all physical agents which act on the symptomatology of the affection and on the psychic condition of the patient at the same time. The measures referred to are psychotherapy and all agents of physiotherapy: isolation, direct and indirect suggestion, hydrotherapy, electrotherapy, radiotherapy, thalassotherapy, crenotherapy, and exercises.

We shall refrain from discussing the special indications of all these physical agents for the treatment of pseudotabes. But we shall dwell at some length on the physiotherapeutics of pseudotabes and, more especially, on its treatment by massage and reeducation of movements, which we consider the method of election in these cases. Experience has shown that physical agents act on the patients in question by direct action on their motor disturbances, and by indirect suggestive effect on their psychic troubles. Massage stimulates the circulation in a large number of pseudotabetics and counteracts the destructive influence of the causal etiological agents. Thus in many cases it suffices to massage the paretic muscles in order to arrest the paresis and to prevent in this way the onset of muscular paralysis. The ordinary principles of massage must be observed: that only the muscles in a state of hypotonia require treatment. Mechanotherapy and gymnastics can be frequently utilized as complementary agents. Alone, reeducation of movements forms the pivot of the kinetic treatment of pseudotabetics; for reeducational exercises take the principal share in correcting the motor disturbances of these patients and in influencing their psychic condition. The choice of reeducational exercises is of great importance in this connection. All the different series of exercises should not be gone through repeatedly, otherwise they might be discredited in the eyes of the patient. He must not be allowed to come to the conclusion that his exercises are too simple and, consequently, not suited to his condition; neither should his exercises be too difficult so that his enthusiasm gets chilled by the impossibility of their execution. The nature of the exercises at the commencement of the treatment of pseudotabetics vary; thus, if in one case we begin with walking exercises, in another we start with those aiming at standing upright, equilibrium of the

trunk, or stability. If a pseudotabetic is in a stage resembling locomotor ataxia of the first degree, we begin at once with exercises on the graduated floor or with a chair, in other words we aim at regularizing his steps or at teaching balancing of the chest. And often we can note that such exercises succeed in securing further results, such as reduction of the basis of support or progression on the horizontal ladder. In the rare cases of pseudotabes with advanced weakness we commence reeducation by exercises in the sitting position, whereas with true tabetics the prone position is adopted.

Whatever the nature of the exercises chosen, they are always arranged in rapid and almost uninterrupted progression, so that a period of one or two weeks enables the pseudotabetic to regain his coordination completely. Just as much depends on his psychic condition. In this connection we must make use of psychotherapy, verbal assurance, reasoning, suggestion. All these measures together and reeducation, succeed in mastering the motor disturbances, especially when the patient becomes convinced that the exercises prescribed are within the boundaries of his strength and physical powers. One certainly must look to the action on the psychical element in pseudotabetics in order to find the explanation of the miraculous effects of the many new methods advertised by the daily press in a sensational fashion and utilized by some people for the shameless exploitation of public credulity. There is no need to describe all these methods; it is quite sufficient to glance through the lay papers in order to find instances. However, the fact must be pointed out with emphasis that the great majority of tabetics proclaimed to be definitely cured are only doubtful cases or simply pseudotabetics.

1. Pseudotabes is not as rare as has been assumed. It may be due to a number of different causes, such as intoxication, infection and overwork.
2. Pseudotabes may also have a syphilitic origin.
3. The symptoms recall those of true tabes dorsalis. They are distinguished by the intensity of their manifestations and by their complete disappearance ultimately.
4. It is characteristic of pseudotabetics to be cured completely in all instances.
5. Pseudotabes is distinguished from tabes dorsalis by the evolution of the symptoms, by their rapid development, and by their customary curability.
6. The treatment of election of pseudotabes must comprise treatment of the etiological cause and also symptomatic treatment. Physiotherapeutic treatment occupies a predominant place in the second instance. Thanks to the four physical agents, of which it is built up, this treatment renders great service in the therapeutics of pseudotabes, whatever the origin of the disease. Among these four physical agents, reeducation must be considered the most rational measure, being calculated to combat at the same time both the motor disturbances of progression and the psychic state of pseudotabetics.

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Protein Sensitization with Special Reference to Bronchial Asthma, Hay Fever, and Eczema*

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The theory of protein sensitization is so familiar and so much has been written on the subject that I shall not review the literature and present a discursive paper on its etiology; I shall only touch on those aspects which concern us as practical physicians and clinicians. It is impossible to say anything about it without quoting freely from I. Chandler Walker's classical researches. I wish to acknowledge a great indebtedness to him. His excellent writings have been of the greatest assistance to me in this work, and I take this opportunity to acknowledge my appreciation of the courtesy shown me while visiting his clinic.

Now, in what way are we interested in a subject which up to the past few years has been the concern only of research workers and professors of medical science? In what way does it enter intimately enough into our diverse practices to make worth while a discussion of this kind? Before answering these questions let us define protein sensitization. It is that state in which an individual is sensitive or hypersusceptible to some foreign protein to which he maintains a certain intrinsic physiological antipathy. This antipathy lies essentially in the blood, a product of the intricate chemistry of that tissue, about which we as yet know so little. By means of the blood it is disseminated throughout the entire organism, with the result that whenever there is absorption of the specific protein to which the blood is antagonistic, an unmistakable and typical reaction is set up, whether that absorption be by way of an abraded surface, as scarified epithelium, or by intact but vulnerable epithelium, as the conjunctiva or alimentary tract. How and why it is set up we do not know; it is an individual idiosyncrasy; and this remains a fascinating problem for some future Pasteur to solve. But we do know this—and this enters intimately into our practice—that even as individuals differ in susceptibility to the various foreign proteins, so do they differ in the type of their reaction. In one, the reaction may occur as the violent coryza so familiar to us as hay fever and rose fever, or what could be termed anaphylactic vasomotor rhinitis; it may occur as an eczematoid eruption; it may present itself as a gastric disturbance, or in a still more interesting fashion, as bronchial asthma.

The proteins may enter the body by inhalation, ingestion, absorption, and infection; by inhalation through the respiratory tract; by ingestion through the digestive tract; by absorption, apart from inhalation and ingestion, through the conjunctiva and to a less extent, the skin; by infection through the presence of pathogenic bacteria in any part of the body, especially in the teeth, tonsils, nose, throat, lungs, and intestinal tract.

Now let us consider the most common of these

proteins. Food proteins generally cause skin diseases, especially in children, as egg white, wheat, milk, beef, strawberry, oats, tomato, fish, almond, pork, buckwheat, oyster. The most common proteins causing hay fever are ragweed, goldenrod, red top, golden glow, sunflower, timothy, and corn. Emanation of hair of the horse and horse dandruff are the most common epidermal cause of bronchial asthma. Wheat and egg are the most common of the food proteins to cause asthma; oats, corn, beef, fish, almond, chicken, walnut, rye, pea, and peanut, the next active of the food proteins. Ragweed is the pollen protein most frequently causing asthma. In some cases these pollens caused hay fever, rather than asthma, and in other cases the pollens were probably the primary cause of the asthma but bacteria continued the condition.

The most frequent bacterial cause of bronchial asthma is the protein of *Staphylococcus pyogenes aureus*, the *Streptococcus hemolyticus*, the *Staphylococcus pyogenes albus*, and the *Micrococcus catarrhalis*. A patient may be sensitive to one protein or to a combination of proteins. He may react to several of the food proteins or to a combination of food, animal, plant or bacterial proteins. This is known as multiple sensitization. It is commonly found and is more difficult to treat than the cases of simple sensitization.

In the study of each case a detailed history of the patient is of the greatest importance. A note should be made of the age of the patient, home and business environment, occupation, habits, and family history, mode and season of onset, and the course of the disease during the beginning. The family history in asthma, hay fever, or food allergy is very important. It has been shown that patients with idiosyncrasies to some foreign protein apparently inherit the tendency in at least fifty-five per cent. of the cases; where the symptoms are due to bacteria the patients inherit the tendency in about ten per cent. If it is suspected that some foreign protein substance is the basis of the condition, the diagnosis consists of the identification of the protein. The particular food thought to be causing the symptoms should not be avoided before the test is made; the result may be a negative test which would not prove the sensitization. We know that patients who are susceptible to certain foods, animal dusts, and pollens, will react positively when a solution of the protein is applied to a scratch on the arm, called the skin or cutaneous test, or a solution of the protein in high dilution and in definite quantity is injected between the layers of the skin, which is the intradermal or subcutaneous test. Both of these are commonly used and the result is usually the same.

The intradermal test is more delicate than the cutaneous test, but has a more limited application. The objections to the intradermal method are: 1. It

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is more difficult to perform. 2. It is often quite painful and one can test only comparatively few proteins at each session. 3. There is greater danger of infection; it requires careful technic and the careful sterilization of all instruments and solutions used. 4. There is danger of causing serious reaction by the introduction of an overdose in a highly sensitive patient. 5. Frequent occurrences of pseudo-reactions.

For these reasons I have employed the cutaneous or skin scarification method almost exclusively, and it has been shown, not alone by my own work, but by careful and extensive studies carried on by Walker, to be just as accurate as the intradermal method with the added advantage of greater simplicity and less disturbance to the patient. The test is done as follows: A number of small cuts, each about an eighth of an inch long, are made on the flexor surface of the forearm. These cuts are made with a sharp scalpel, but are not deep enough to draw blood, although they do penetrate the skin. On each cut is placed a protein and to it is added a drop of tenth normal sodium hydroxide solution to dissolve the protein and to permit of its rapid absorption. At the end of half an hour the proteins are washed off and the reactions are noted, always comparing the inoculated cuts with normal controls on which no protein was placed. A positive reaction consists of a white elevation or urticarial wheal at the site of inoculation. The smallest reaction that we call positive must measure 0.5 cm. in diameter. All larger reactions are noted by a series of plus marks and any smaller reaction is called doubtful. If a smaller wheal surrounded by an area of erythema appears around one or two of the tests I consider it of great importance and insist on repeating the tests with these proteins at a later date. At times no wheal appears but a definite erythema occurs around one or two of the tests, and although this cannot be called a positive reaction it must be viewed with suspicion and the tests repeated.

In performing and interpreting the skin test there are a few things that should be remembered. Occasionally we get a negative reaction to a protein to which the patient is really sensitive if the test is performed immediately following an attack due to that particular protein. Occasionally reactions are obtained to food proteins of which food the patient has never eaten. This is due to an inherited sensitivity and, of course, these foods must be avoided. This is of importance in cases of wheat sensitization, where one would test against rye and corn to determine if these are safe for the patient to take instead of wheat. Occasionally a reaction is obtained, let us say, to corn, and the patient will say that he has never taken corn. This is explained, as mentioned above, as an inherited sensitivity.

Delayed reactions may also occur. A test which appears negative or doubtful when read a half hour after applying the protein, may become definitely positive twenty-four hours later. This is the exception, not the rule. A marked difficulty arises in the interpretation of cases which have been negative to all tests, but in which a clearcut anaphylactic asthma appears. In these cases there are three possibilities which must be considered and ruled out

before definitely labelling a case negative: 1. The great possibility of having omitted the causative protein from your test. 2. The possibility of a toxin and not a true protein being the cause. 3. The possibility that the patient may at the time of the test be in a stage of recovery from an attack and therefore, with the system loaded with free antibodies, gives a negative reaction to the test. Occasionally a patient gives a positive reaction with a protein that apparently has no bearing on his condition. In cases of this kind the patient may eat sparingly of that particular protein without symptoms arising, but if much of the protein is taken symptoms do arise.

We may differentiate between true or typical bronchial asthma and the atypical or asthmatic bronchitis by means of the cutaneous test. In the typical variety the patient will react positively to the protein or group of proteins which is responsible for the asthma, while the atypical case will give a straight negative to all tests. Occasionally one will find a patient who shows a wheal and erythema around every protein tried out, but it will be found that the control will also be positive, showing that there is at the time of test an abnormal irritability of the skin. These so-called dermatographic skins cause great difficulty; all tests must be discontinued and postponed to a future time.

Specific protein treatment, which is the most successful procedure, consists of treating or desensitizing the patient with those proteins to which the individual is found to be sensitive by the skin test. Bronchial asthma caused by animal emanation is successfully treated by subcutaneous inoculations of the offending protein. Before this can be done, however, skin tests must be made with varying dilutions of the particular protein in order to find out the initial therapeutic dose. Each week the dose is gradually increased. As the amount of treatment increases, the positiveness of the skin test progressively diminishes until the skin test becomes negative with concentrated protein and the patient becomes absolutely desensitized. The treatment outlined above is given in horse, cat, and dog cases, but in those patients who are sensitive to feathers, wool, and the hair or fur of other animals, it is easier to avoid these substances than to treat the patients with their protein. Pollen asthmatics are tested and treated in like manner with subcutaneous inoculations, and the treatment should be given preceding the pollen season, rather than during it. Patients who are sensitive to bacterial proteins are given subcutaneous inoculations with vaccines of that particular organism. Subcutaneous inoculations with offending food proteins do desensitize but the process is long and tedious. The method of feeding proteins has proved unsatisfactory in many cases. The most obvious treatment is to take the offending foods out of the diet and resort only to active immunization in epidermals, bacteria or pollen cases. In most cases this is a simple matter, with the exception of those sensitive to wheat, egg, and milk. The difference in the length of time required to desensitize the patient depends upon the size of the initial amount which the patient can take without symptoms. Climate does not benefit those

sensitive to proteins, with the exception of pollen cases and then only when the patient goes to a place where the particular pollen is not present. The bacterial cases are benefited by warm, dry climates.

In the bacterial cases and those with severe secondary bronchitis, intratracheal injections of oily solutions sometimes give marked temporary relief. For immediate relief of symptoms in paroxysms of true asthma, adrenalin is the drug *par excellence*, but a certain amount of caution must be observed, for some people are quite sensitive to its action and occasionally go into a state of collapse after its use. This reaction is especially likely to occur in asthma and allied conditions where the sympathetic nervous system is in a highly unbalanced state.

In the preparation of an autogenous vaccine for the treatment of the bacterial type of asthma or the relief of the secondary bronchitis, a sterile specimen of sputum is examined for the predominating organism, and if this corresponds with the reaction obtained by the skin test, a simple vaccine is used. If, however, the predominating organism is one other than that giving a positive skin test a mixed vaccine should be used, using the predominating organism and the one giving the skin test.

There is a group of cases of asthma, perhaps more correctly classified under asthmatic bronchitis, where we obtain no reaction to proteins—all the tests are negative. These cases are probably of infectious origin and are very refractory to treatment. I have a series of fifteen of these cases in which I have used injections of a nonspecific protein, using intravenously a secondary proteose as my antigen. In four of these cases I obtained relief of symptoms, in three marked relief, in two slight relief, and in the remaining six no improvement. This form of treatment, which has been extensively used in the treatment of chronic arthritis, is still in its infancy in asthma and allied conditions. In two cases of hay fever during the acute stage, I have injected the patients with secondary proteose without apparent influence on the symptoms or course of the disease. The question of passive anaphylaxis is one which must not be entirely overlooked, the clinical importance of which I called attention to, in a case which I reported (1). Whether this was a true case of passive anaphylaxis in the strict sense of the term, I am not prepared to say, for more careful laboratory study than was carried out in this case would be necessary before definitely determining this question.

The bronchial asthma cases may be classified as follows: Those sensitive to proteins and those not sensitive to protein. Then divide these into those occurring throughout the year and the seasonal cases. The cases not sensitive to protein are classified as due to bacteria, while those sensitive to protein are subdivided into those occurring throughout the year due to animals, food, and bacteria, and the seasonal cases due to pollens.

The prognosis of asthma with proper treatment is excellent in the sensitive cases, provided the patient has not chronic bronchitis or marked emphysema. The severity of bronchitis, the degree of emphysema, and the resistance of the individual to bacteria modify the prognosis in the nonsensitive type.

HAY FEVER.

In testing hay fever cases it is necessary to emphasize the importance of testing not only with the various pollens as is ordinarily done, but also with all the foods, epidermals and bacteria, for although most cases of so-called hay fever, or seasonal vasomotor rhinitis, are true pollinoses, a certain number are due to one of the other proteins, either entirely or as an associated sensitization, which aggravates the symptoms and the elimination of which is necessary in order to obtain complete recovery.

A great many patients show multiple sensitization and I am convinced that in order to obtain really satisfactory results, one must actively immunize against every pollen giving a definite reaction. This conclusion I believe is contrary to the view expressed by Walker, who asserts that immunization against the pollens giving the largest reaction of a botanical group is sufficient. For example:

If a patient reacts very strongly to ragweed and weakly to goldenrod, Walker advises using ragweed solely in the treatment. I hope I am not misquoting him but that is my understanding of his views on the subject. I feel justified in stating, after careful observation of several classical cases, that all the pollens giving a definite reaction should be used in the treatment. I have not collected my results, in a large number of cases that I treated this past year, but I know they have been much more satisfactory than in previous years and I expect them to be even more so next year, for I am starting the injections at least four months before the expected onset of the attack. I think this is important. Treatment should be started about four months before the pollen season and continued right up to it and at times during the season, dropping down to a small dose of a high dilution. I also believe it is necessary to carry the immunization down to a one in one hundred dilution, giving as much as ten minims of this dilution. The separate pollens in varying dilutions should be used and the dose adapted to the individual patient.

ECZEMA.

Our present knowledge of the etiology and specific treatment of eczema is so vague that any procedure indicating a clearer understanding of this condition is indeed worthy of special note. Only a small percentage of all eczema cases are anaphylactic, but it is essential that patients be thoroughly tested in order that they may be properly classified and treated.

Before concluding I will give a brief review of several cases exemplifying the various clinical types of protein sensitization.

CASE REPORTS.

CASE I.—C. H., male, aged fourteen, had attack of asthma on and off for the past four years. Between attacks he felt perfectly well. His previous history was negative and his family history was also negative. Skin tests with the various proteins showed a two plus reaction to herring. Elimination of this food from the diet resulted in a complete recovery. The patient was seen six months later and was absolutely free of all symptoms.

CASE II.—I. P., female, aged eight, had suffered repeated attacks of bronchial asthma for the past two years. Her tonsils were removed four years ago; no other previous illness. Family history was negative. Skin tests showed a positive reaction to wheat, rice and codfish. Complete elimination of these foods resulted in recovery. Patient occasionally suffered mild attacks, characterized by cough, wheezing and slight difficulty in breathing, but they were of short duration and caused her little discomfort. They are probably due to the taking of wheat inadvertently.

CASE III.—M. S., female, aged forty-five. She had had frequent and repeated attacks of asthma for the past eight years, but felt comparatively well between attacks. Skin test showed a four plus reaction to horse dandruff, and reacted to as high as one in 100,000 dilution. This patient was inoculated with increasing doses of horse dandruff. Symptoms gradually disappeared and she became absolutely free of all asthmatic symptoms. Close contact with horses now cause no discomfort.

CASE IV.—M. B., female, aged forty-seven. She had had asthma for the past fifteen years; had not had a good night's sleep in eight to ten years, and slept on a chair every night. For the past few years she had had a distressing cough, with expectoration, and shortness of breath; previous to this she was free from symptoms during the day, the attacks coming on at night. Examination showed a two plus reaction to goose feathers, a one plus to *Staphylococcus albus* and one plus to *Micrococcus catarrhalis*. Examination of the sputum showed the predominating organism to be a *Micrococcus catarrhalis*; there were some staphylococci present.

A mixed vaccine was prepared and injected weekly. The feather pillow was discarded and a hair pillow used in its place. Symptoms improved considerably on discarding the feather pillow. The cough and expectoration improved rapidly under the vaccine treatment, but some cough and slight shortness of breath still remained, due to emphysema and fibrous changes in the lungs. However, the patient now sleeps in bed every night and is comfortable.

CASE V.—J. W., male, aged twenty-two. He had had asthma for the past six years and had noticed the relation of dogs to his symptoms. Skin test showed a three plus reaction to dog hair. Patient was inoculated with varying dilutions of dog hair and can now come in close contact with dogs without discomfort.

CASE VI.—C. E., male, aged fifty-three. He had had repeated attacks for the past fourteen years; symptoms had been growing worse and finally there was constant cough with expectoration. He had had a dog in the house for the past seven years, but it was only within the past few months that he noticed any decided influence on his breathing when in close contact with the dog. Cutaneous tests were strongly positive to dog hair, goose feathers, beef, rice, oat, and rye; also to *Staphylococcus aureus* and *Micrococcus catarrhalis*. The foods to which he was sensitive were removed from his diet, and injections of dog hair and a vaccine of *Staphylococcus aureus* and *Micrococcus catarrhalis* given. The feather pillow was also discarded and a hair pillow

used instead. This patient improved rapidly and is now practically well, though he gets an occasional attack of embarrassment in breathing and cough, especially if exposed to dust or a cold wind.

CASE VII.—W. F. T., male, aged thirty-nine. Had suffered from asthma for the past two years, following severe bronchitis. Cutaneous tests were negative to the various foods, pollens, and epidermals, but positive to *Staphylococcus albus*, and *Streptococcus communis*. An autogenous vaccine was prepared and injected in increasing doses. The patient improved rapidly and two months later he was free from symptoms which have not recurred although treatment was discontinued nearly eight months ago.

CASE VIII.—C. G., female, aged twenty-five. Had suffered from asthma for the past five years; during the first three years only during August and September, but for past two years had had recurring paroxysms throughout the entire year. There were no hay fever symptoms at any time. Cutaneous protein tests were negative with the various foods and epidermals but strongly positive to ragweed and corn pollen and to *Staphylococcus aureus* and *albus*. A vaccine was prepared and injected during the winter, spring and summer months and injections of ragweed and corn started last May. The patient improved markedly on vaccine treatment and went through a season without symptoms.

I will not take up space by citing ordinary cases of hay fever, showing single or multiple pollen sensitization, but will review briefly the history of one or two hay fever cases showing sensitization to bacteria, foods, and epidermals, as this phase of sensitization as regards hay fever is often overlooked.

CASE IX.—C. J., female, aged twenty, for the past few years had had repeated severe attacks of sneezing, itching and running of the eyes, coming on especially during June, July, August and September, during which time she always went to her country home. She occasionally had similar attacks during the winter but they were not as persistent nor as frequent. Cutaneous tests were negative to the various pollens, foods, and bacteria, but strongly positive to the protein of horse dandruff. Repeated inoculations with this protein resulted in complete recovery and satisfactory protection.

CASE X.—H. H., female, aged thirty-five, had repeated attacks of itching and running of the eyes, coryza, and sneezing, coming on during June, July, and August. Cutaneous tests were negative with the various pollens, bacteria and epidermals, but strongly positive to strawberry, blackberry, and cantaloupe. The patient abstained completely from taking these fruits this season and was absolutely free from symptoms, except on one occasion, when she had a little itching of the eyes and sneezed once or twice after eating strawberry ice cream.

In conclusion, allow me to say that I do not intend to convey the impression that all patients with asthma and hay fever respond as satisfactorily to treatment as those which I have cited; for these are selected cases, reviewed for emphasis and exemplification. However, I do believe that a sufficient number are definitely of protein origin and can be materially helped, thus justifying the testing of all suspected cases.

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2 WEST EIGHTY-EIGHTH STREET.

Protein Desensitization From the Point of View of the General Practitioner

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An increasing number of diseases are being recognized as of protein origin. Some of them have been very puzzling to the general practitioner and because the true character of the disease was not understood treatments have been hazardous and usually ineffectual. Among the disturbances which are frequently met with are various skin affections; infantile convulsions and epilepsy; digestive disturbances, such as auto-intoxication; indigestion and conditions simulating gastric ulcer; and hay fever and asthma. In fact it is not uncommon to have a patient present symptoms of more than one of these disturbances, which are eventually found to be referable to one or more proteins poisoning the system.

After a brief review of the subject of protein sensitization and my method of desensitization, the disturbances mentioned will be considered in the order named.

Brown (1) believes that the undue reactions caused by the protein of food may take place in

any tissue or organ of the body, and the symptoms produced do not depend upon the variety of the protein but upon the tissue in which the manifestation takes place. He, as well as O'Keefe (2), calls special attention to the evident hereditary tendency of protein sensitization, as it is not uncommon to find whole families sensitive to one or more protein foods. The source of the proteins is practically endless, including not only foods, but hair, dandruff, bacteria, and pollens from many trees and flowers. The method of determining to what protein or proteins the patient is sensitive is comparatively a simple matter. It has been fully described by Blackfan (3), Walker (4), Coke (5) and others.

Of the several tests to determine a patient's sensitization to proteins, the one which has proved safe and most reliable is the skin test, performed briefly as follows:

The flexor surface of the arm is thoroughly cleansed and a number of small cuts, not deep

enough to draw blood, are made, each about one eighth of an inch long. On each cut is placed a protein and to this is added a drop of decinormal (four tenths per cent.) sodium hydroxide solution. Proteins are permitted to remain on cuts for half an hour, after which they are washed off and the reactions noted, always comparing the inoculated cuts with normal control on which no protein was placed, but to which a drop of the solvent was applied. A positive reaction consists of a raised white elevation or urticarial wheal. Generally surrounded by erythematous blush, the smallest positive (one plus) reaction must measure 0.5 cm. in diameter. Any smaller reactions are doubtful. Negative skin tests with proteins rule out those proteins as a cause of the symptoms. All the proteins which react positively must be suspected. If the patient is sensitive to food proteins, such foods should be omitted from the diet for at least a month, following which it sometimes happens that the toxic food can be returned to the diet in gradually increasing amounts. Change in living habits usually is all that is necessary to avoid contact with toxic proteins whether foods or animal emanations.

In those cases where relief cannot be effected by change of daily routine, active treatment must be instituted. Reaction to pollens should be anticipated by pre-seasonal treatment. A course covering ten or twelve weeks and comprising at least twelve injections should be completed, if possible, before commencement of pollination. If, however, the pollinating season arrives before the completion of the necessary injections and continuation or repetition of the treatment is considered advisable, the initial dose must always be of such a high dilution that there is no skin reaction whatever and the increase of doses must be given more slowly than in the pre-seasonal treatment.

The majority of physicians treat cases of eczema by intestinal cleansing, such as calomel purges, intestinal antiseptics, and high enemas. Patients suffering from eczema are told by the dermatologist to eliminate red meats from the diet. Some of these patients are relieved, some cured, thus showing that they belong to the class which is sensitive to beef protein. Strawberries often cause urticarial rash almost immediately after ingestion. Sea food may act in the same way. It must be emphasized that no one food protein is at fault in all patients; it depends upon the particular protein to which the patient is sensitive.

According to the experience of Ramirez (6), in only a small percentage of eczema cases are the patients anaphylactic, but when the skin condition is associated with asthma or hay fever it is usually so. It is therefore essential that patients be thoroughly tested for protein sensitization in order that they may be properly classified and treated. O'Keefe (2) has reported observations upon seventy cases of dietary eczema in children under four years of age. The tests were made by linear scarifications upon the back instead of the arm, as is usually done in adults. Although the mother in no case showed sensitization to the protein to which her child reacted, nearly twenty per cent. gave a history of asthma, eczema, or urticaria in some other member

of the family. Elimination or modification of the offending food resulted in so markedly improving the children's condition that O'Keefe concludes that dietary regulation is essential in the treatment of eczema.

We know that attacks of infantile convulsions can be avoided or lessened by intestinal purging, enemas, and intestinal antiseptics. This directs attention at once to the food ingested. Formerly, teeth were considered as the inciting factor. Although some cases of epilepsy develop late in life, the great majority occur between the ages of two and seven. When we consider that this is the age when the child leaves his nursing mother to partake of adult diet, we witness an attack of convulsions which in a great many cases is a forerunner of a later epilepsy. In most cases of epilepsy there is no pathological lesion, excluding, of course, traumatism; the attack appears after a hearty meal. Such attacks are lessened or aborted by cleansing the intestinal tract thoroughly. In static seizures the accepted treatment is limited diet and intestinal cleansing by antiseptics and high colonic irrigations. Is it not reasonable to suppose that by this treatment we rid the body of all foodstuffs which contain the offending protein or proteins?

Dr. H. Geyelin, of New York, in a paper read before the American Medical Association in Boston, in June, 1921, told how very effective had been his fasting method of treating epilepsy. In the discussion following the paper, Dr. Stanley Cobb, of Boston, and Dr. Tom A. Williams, of Washington, spoke very favorably of Dr. Geyelin's theory. The method consists of putting the patients on a series of fasting periods. During these fasting periods they had no attacks, showing that the foods containing the protein to which the patients were sensitive were probably the cause of the epilepsy. Dr. Frederick De Lue, of Boston, also discussed the paper and spoke highly of advocating a diet. In view of this testimony and my own experience, I believe that food is the dominating cause of epilepsy. I think that if epileptics were tested and the foods containing the proteins which reacted positively were eliminated from the diet, we would see a great improvement in the patients, if not an actual cure of the disease.

I am inclined to believe that rheumatism and neuritis may also be caused in some cases by protein sensitization, just as in the case of skin disease and epilepsy. This field needs further investigation, however, before positive statements are warranted.

In certain digestive disturbances, however, sensitiveness to certain proteins has been definitely shown to be the underlying cause. Recently the French pediatricist, Grueit (7), reported on the toxic property of cow's milk made evident by the injurious effect on very young infants. The protein is not enzymatic in nature, and is apparently heat stable to a considerable extent. It is only imperfectly attacked by the digestive juices of the infant, and also is able to make its way through the gastroenteric wall and into the circulation, where it deranges the metabolism. Incidentally it often leads to nitrogen retention, and the symptoms of uremic intoxication become evident. The development of acidosis may

also be seen. In general, the condition invariably terminates in a wasting process.

Still more recently the experimental work on rats done by Hartwell (8) showed the extraordinary reaction which will follow upon the excessive ingestion of a specific protein. In this experiment caseinogen, added to the diet of the nursing mother, caused the death of the rats while the mother remained in apparently good health. The few rats which survived the lactation period were not successfully weaned. The young rats had fits, exhibited extensor and contractor spasms, and just before death extreme exhaustion was evident. While it is unlikely that a nursing woman would ever take so large a proportion of a specific protein as was given in these experiments, it is clear that excessive protein in the mother's dietary may lead to metabolic and nervous trouble in the nursing child.

Case I, reported at the end of this article, is typical of my experience with protein intoxication causing gastric symptoms. Ramirez (9) reports the case of a child of seven who had attacks of severe epigastric pain. The attacks came on three or four hours after eating and lasted thirty minutes. X ray examination showed a decided pylorospasm. The protein test showed a strongly positive reaction to whole egg. Four months after the entire elimination of egg from the diet the child had only occasional attacks, but the skin test was still slightly positive. Ramirez believes the occasional attacks were due to the presence of some egg in the food. He has had four cases of pylorospasm with moderate increase in gastric acidity of definite anaphylactic origin in which the spasm completely disappeared on removal of the offending protein.

That hay fever and asthma may be cured by protein desensitization is probably more generally recognized than the diseases previously referred to. Undoubtedly this is due to the fact that individuals affected with these respiratory diseases noticed the connection with flowers and attention was directed into the proper channel. Among those who have done excellent work in this field are Walker (4, 10), Babcock (11), Thro (12), Donnelly (13), Cooke (14), Ramirez (9), Coke (5) and Luckie (15). Naturally a diversity of methods has been the result of the various researches. Experience has shown, however, that essentially the treatment outlined at the beginning of this article has been most practical, as well as gratifying in results. Therefore no other methods will be detailed at this time and the reader is referred to the bibliography for the historical development of this treatment.

Ramirez (16) has reported a striking case illustrating an acquired anaphylaxis. A man was transfused with 600 c. c. of blood with no immediate discomfort. Two weeks later, on going out for a drive, he was seized with violent asthma. He had never had any symptoms before. It was found that the donor of the blood was an admitted horse asthmatic, and on testing it was found that he was sensitive to a much higher dilution than the recipient. Another man who had received blood from the same donor presented no symptoms of asthma.

The following case reports are typical of my observations with the effect of protein sensitization:

CASE I.—J. D., German, butcher, aged forty-two years. Chief complaint: stomach trouble for the past five years with symptoms typical of gastric ulcer. He had been to various stomach men who diagnosed his case as gastric ulcer of the pylorus and advised operation. As he refused this he was referred to me as possibly suffering from anaphylaxis. His radiograph was negative. Tested with the various proteins on his diet list, he showed four plus to beef, three plus to onion and two plus to cabbage. Without questioning the diagnosis of gastric ulcer, I told him to eliminate these three foods from his diet and report back to me after a week. At his second visit he informed me that he had suffered from none of the symptoms during the past week. I then had him try eating a little beef, onion and cabbage for a week. At the appointed time he reported that he had had a return of the symptoms. He then completely eliminated these three foods for a period of six weeks and reported that he had had no return of the symptoms. He has now gone for four months without a recurrence.

CASE II.—J. D., a boy of three years, had suffered from eczema for two years. He had been treated by various physicians without success and was referred to me for a protein sensitivity test. He showed three plus to white of egg and two plus to potato. His mother eliminated these two foods from his diet and by the end of a week the rash had entirely disappeared.

CASE III.—Mrs. R. S., aged forty-nine years. Chief complaint: slight attacks of hay fever and eczema starting about the middle of August and continuing to the latter part of September, every year for the past ten years. She was sent to me in June, 1920, to be tested for the possible cause of the hay fever. She showed five plus to ragweed and two plus to daisy. I started treatment at once to immunize her and she passed through the fall season with no attack of hay fever and no sign of eczema. I believe the eczema was due to the ragweed.

CASE IV.—R. H., a boy of nine years. Chief complaint: asthma for six years. He was referred to me for protein diagnostic tests. He was found to respond four plus to chicken feathers. He lived on a farm where there were a number of chickens and he slept on a feather bed and mattress. A hair mattress and pillow were substituted with some relief. This was in January of the present year. I was about to start immunizing him against chicken feather protein when his aunt informed me that she dreaded the spring and fall because they seemed to aggravate his symptoms. I then tested him for the spring and fall pollens. He showed six plus to orchard grass and five plus to ragweed. I started treatments with orchard grass. I did not use feathers as he could partially avoid them. The twelve treatments for orchard grass were finished by the middle of June. During this period he had had but two attacks which were very slight. From the middle of June alternate treatments for immunization against ragweed and feathers were given.

CASE V.—N. S., a man of twenty-eight years, a chauffeur, had suffered from asthma for twenty years. His mother told me that as a young boy he

was in the habit of playing in a stable near their home. It was at that time that he first showed asthmatic symptoms and he was taken to a doctor. She supposed he had catarrhal bronchitis, but the doctor diagnosed a typical asthma. The boy had always lived near stables and he had noticed that he always had attacks when he came near horses. Of late years he had had symptoms when he drove the automobile into the country. Tests for horse dander and the spring pollens showed him to be four plus sensitive to the former and six plus to timothy grass. Alternate treatments for the two proteins have effected a partial immunization. He has had four slight attacks since last February. The treatments for horse dander have not yet been completed.

CASE VI.—Mrs. F., aged thirty-five years, a sufferer from asthma since she was sixteen years of age. Tests for all proteins were negative except for *Staphylococcus pyogenes aureus*. Twenty-two treatments brought about no immunization.¹

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411 NINTH STREET.

Pollen Protein Intoxication in Nonseasonal Bronchial Asthma*

A Study of Thirty Cases

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During the past few years much has been written about food protein sensitiveness and animal emanation sensitiveness as exciting causes of asthma. In September, 1918, at a meeting of the Pennsylvania State Medical Society, we expressed our disappointment in food protein sensitiveness (1). If we stopped at food tests and did not look for other factors as a cause for the paroxysm, we should certainly be far from doing good to our patients, notwithstanding the fact that in some cases it might be the only cause producing the asthmatic paroxysm, as has been so ably presented by Dr. Walker, of Boston. We have thus made it our practice to have each patient tested for all food proteins, animal emanations, bacterial proteins, and all pollens routinely, in all one hundred or more tests.

Pollination has been considered by all asthma students as a cause of hay fever and seasonal asthma; in other words, pollination is understood to be the exciting factor responsible for the occurrence of hay fever in the spring, summer and fall, which in some cases is accompanied by asthmatic paroxysms during the pollination period. Testing the patients

routinely on a large scale, we find that the majority who suffer from asthma all the year round, or so-called nonseasonal asthma, show positive skin reactions to one or more pollens, and that in some of them it was never accompanied by any symptoms of hay fever, as far as the information from the patients was concerned. Eight patients, or about one third of those tested, showed positive skin reactions to pollens only. One patient, who was positive to ragweed pollen from ninety tests, had had asthmatic paroxysms throughout the year since childhood. Another patient was positive to corn pollen from eighty tests, who had had paroxysms throughout the year for ten years. Still another was positive to all pollens of the spring, summer and fall, and had had paroxysms throughout the year for fifteen years.

True, a certain number of this type of patients, who had had hay fever symptoms for a number of years previous to the development of asthma, for the last few years did not have any symptoms of hay fever, but had had asthma throughout the year; thus, pollination, which is probably the exciting factor responsible for the paroxysms, was not thought of by the patient or the physician. My observa-

*Read before the Philadelphia County Medical Society, June 8, 1921.

tion of the thirty cases lead me to believe that in sixty-six per cent. of the patients suffering throughout the year the asthmatic paroxysms are due to pollination; hence, nonseasonal asthma is not necessarily due to bacterial infection only, unless pollen sensitiveness is also excluded from the diagnosis. Some of these patients had positive skin reactions to both fall and spring pollen, while others had positive reactions to either fall or spring pollen.

The asthmatic paroxysms were evidently due to the pollen in question, as an exciting factor, because the patients improved when desensitized by the offending pollen or pollens, and sixty per cent. of them had no more paroxysms after a few desensitizing doses. Some of these desensitized patients have remained well, while others have had a return of the asthmatic paroxysms occasionally. In the other forty per cent. desensitization did not make any improvement, possibly due to the presence of various complications, such as emphysema, myocarditis, irreparable nasal and throat abnormalities, and general endocrine disturbance in two female patients, possibly of ovarian origin. The frequency and severity of the paroxysms are the same as before, although in some of them no other positive skin reactions could be demonstrated by rather extensive skin tests. One patient, A. P. G., after fifteen desensitizing injections showed no improvement in the asthmatic paroxysms, and on retesting gave the same positive reaction as when treatment began.¹

We think that, fundamentally, patients sensitive to a certain pollen cannot throw off the pollen protein intoxication when once they have come in contact with it, and that state is kept up by some patients throughout the year, and in others irregularly throughout the year. In the same manner one of the patients who had so-called horse asthma, giving a positive skin reaction four plus to horse dander and horse serum, suffered from paroxysms all the time, whether he was near horses or not. Of course this patient stated that he would be worse or his attacks more violent when he happened to be near horses, but the asthmatic paroxysms were always present, though he might be miles away from horses. A similar history is obtained from the pollen asthmatic; that, though he might have paroxysms throughout the year, he might be decidedly worse at the pollination period.

The majority of asthmatics were found sensitive to some form of food protein, animal emanation, and pollen proteins—twenty-four out of thirty; a lesser number, or twenty per cent., did not show any sensitiveness by the skin reaction tests to the above mentioned proteins, hence, we should be guarded in stating that proteins were the only exciting factors responsible for the production of paroxysmal dyspnea. Many doctors are of the opinion that in all those patients who do not show sensitive skin reactions to food or animal emanation the asthmatic paroxysms are bacterial in origin and that good results are obtained from autogenous vaccine. In a great many of my own patients, the results from autogenous vaccine were far from favorable, al-

though the vaccines were prepared in a good laboratory, according to the method as suggested by its advocates.

Desensitizing a great number of patients and carefully recording the results, testing and retesting them every two months in the course of their treatment, we are impressed by the following conclusions: That a pollen positive asthmatic should be desensitized for the particular pollen or pollens he shows a positive reaction for, no more and no less. This rule applies also to seasonal rhinitis, or so-called hay fever. To be more specific, the majority of the pollens are classified as Graminæ, Compositæ, Leguminosæ, and so on.

If a patient is positive to ragweed, goldenrod, golden glow, and daisy, you cannot desensitize him so as to improve the asthma by injections of ragweed alone, although they all belong to the same class, Compositæ. It will be necessary to inject an extract containing all of the above mentioned pollens to which the patient has shown a positive reaction, in order to get well. Again, if a patient has had a positive reaction to timothy and red top, you will not have satisfactory results when using a polyvalent pollen containing timothy, red top, June grass, orchard grass and rye, although they all belong to the same class, Graminæ. If you do, you will induce an acquired sensitiveness in the patient for the other three pollens, which he was not sensitive to originally, for this has repeatedly and distinctly shown to be the case by retesting these patients in the course of the desensitization treatment.

The same reaction happened in the case of horse dander and horse serum positive asthmatic, mentioned above. After three months of horse dander desensitization, the patient's improvement was not marked, but on the addition of horse serum desensitization, the patient made a marvelous improvement and at present is free from asthma. Therefore, desensitization should be more specific in order to get proper results, with fewer failures. A specific pollen extract prepared according to the positive reaction tests obtained from the patient could be made to order in from four to six days, by simply making the proper dilution from concentrated stock extracts.

In conclusion, I would like to state that those of us who are engaged in studying and treating paroxysmal dyspnea, or so-called asthma, realize that much is yet to be learned before the problems of the asthmatics are entirely solved. I am presenting to you the results of my observations as I find them, without any exaggeration on my part and carefully guarding against undue enthusiasm in the application of the protein work, and ask that you consider and discuss them. To treat paroxysmal dyspnea successfully, we must intelligently apply our knowledge of general medicine and therapeutics, to test the patients routinely, so as to exclude any sensitiveness or anaphylactic factors of any nature, or to treat them, which depends upon the accuracy with which the cutaneous sensitization tests are performed and interpreted. It depends upon the accuracy and specificity of the methods of desensitization, which should be checked up by repeating tests at intervals to determine the progress of the

¹ This patient called at the office, since this paper was written, and stated that he felt greatly improved.

case in relation to desensitization. Last, but not of least importance, it is necessary to correct any nose and throat abnormality, as well as to treat any possible or probable focus of infection.

SUMMARY.

In this series of thirty cases, twenty patients, or sixty-six per cent., had positive skin reactions to one or more pollens, which apparently had been the exciting factors in the production of the paroxysmal dyspnea throughout the year.

EIGHT CASES OF POLLEN SENSITIVENESS ONLY.

1. J. B. R. Corn, three plus.
2. E. R. W. Corn, three plus; ragweed, short, three plus; sunflower, one plus; goldenrod, one plus.
3. I. R. Corn, one plus; ragweed, short, four plus; ragweed, giant, one plus.
4. A. P. G. Ragweed, short, two plus; ragweed, giant, one plus.
5. C. B. Ragweed, short, two plus.
6. H. S. Corn, one plus.
7. J. S. Ragweed, short, two plus; ragweed, giant, one plus; goldenrod, one plus; daisy, one plus; red top, one plus; golden glow, two plus, dahlia, one plus.
8. H. R. Corn, two plus.

TWELVE CASES OF MIXED SENSITIVENESS, IN THE MAJORITY POLLEN SENSITIVENESS PREDOMINATING.

1. A. S. B. Ragweed, short, four plus; ragweed, giant, four plus; timothy, four plus; red top, four plus; orchard grass, four plus; June grass, four plus; corn, four plus; goldenrod, four plus; daisy, four plus; dock, poplar, maple, tomato, goose feathers, cucumbers, wheat, and potato, each had one plus.
2. M. D. Mc. Ragweed, short, three plus; ragweed, giant, two plus; corn, two plus; June grass, timothy, dog hair, and pneumococcus, each one plus.
3. I. E. Corn, four plus; goldenrod, two plus; ragweed, short, one plus; rye protein, two plus.
4. William W. Corn, one plus; chicken feathers, two plus; Staphylococcus pyogenes aureus, one plus; Streptococcus, nonhemolyticus, one plus.
5. B. Th. Ragweed, short, one plus; goldenrod, one plus; sweet vernal grass, one plus; rye pollen, one plus; egg white, two plus; egg yolk, one plus; cheese, one plus.
6. J. H. Corn, one plus; tomato, one plus.
7. Th. S. Corn, two plus; ragweed, short, one plus; tomato, one plus.
8. C. N. Ragweed, short, one plus; corn, two plus; timothy, one plus; chicken feathers, two plus; potato, two plus.
9. S. E. Ragweed, short, one plus; corn, one plus; locust, two plus; willow, one plus; rabbit hair, three plus.
10. B. S. Ragweed, short, two plus; ragweed, giant, one plus; corn, two plus; carrot, one plus; sheep's wool, one plus.
11. H. S. Ragweed, short, three plus; goldenrod, one plus; corn, one plus; rice, one plus; onion, one plus.
12. M. W. Rabbit hair, three plus; clover, one plus.

TEN CASES NOT SENSITIVE TO POLLEN.

Of the ten cases not sensitive to pollen, three were sensitive as follows:

1. M. R. Horse dander, four plus; horse serum, four plus; almond, two plus; hickory nuts, one plus.
2. Mrs. J. C. A. Cabbage, one plus; lima bean, one plus; oysters, one plus; rye, one plus; butternut, one plus; black walnut, one plus; peanut, one plus.
3. Mg. W. Sweet potato, one plus; Streptococcus hemolyticus, one plus.

SEVEN CASES HAVE NOT REACTED TO EXTENSIVE PROTEIN SKIN TESTS.

1. Mrs. Vi. Myocarditis.
2. C. L. Loss of pulmonary elasticity—apparently no chest expansion.
3. DeL. Atrophic pharyngitis.
4. Dom. Gases from the acids and dyes in the leather industry.

5. Sol. Myocarditis and arteriosclerosis.
6. Na. Apparently no pathological condition.
7. Dub. Mitral regurgitation, right basal pleurisy, cystitis.

CASE HISTORIES.

The majority of histories obtained from asthmatics may not be of great value, but now and then one sees patients whose histories are of rather more than passing importance and I should like to present the histories of several cases which I consider of interest:

CASE I.—Mrs. I. R., a native of Philadelphia, thirty-nine years old, married five years, no children, no miscarriages. Menstruation was normal, of the twenty-eight day type. She had had measles three times, left sided pleurisy eleven years previously for ten days. Her mother died at the age of fifty-five—cause unknown; father living and well. One brother had had asthma and hay fever in the fall for a number of years. Four of an aunt's children (on the father's side) had died from tuberculosis of the lungs. Her father's sister had died of tuberculosis of the larynx and her mother's brother had died of tuberculosis of the lungs. Patient was well built; height five feet five inches, weight 185 pounds.

The patient had had hay fever for nine years from August 15th to frost and never before had been accompanied by attacks of asthma. In May, 1920, three teeth were extracted under nitrous oxygen anesthesia, shortly after which attacks of asthma developed and no attacks of hay fever occurred the following fall. She had had good medical attention with no relief, followed by three or four months of osteopathic treatment, with no improvement. On the advice of a colored woman she was taking kerosene oil, twenty to fifty drops, two to three times a day. She had been free from asthma for forty days, but had had to discontinue the oil on account of a furunculosis produced by it.

At my first call, her temperature was 101° F., and during the following four or five months the temperature was normal most of the time, but occasionally she would have a fever for a number of days, but for two months it was normal. The pulse was always between 120 to 130. Dyspnea was very marked, chest was full of musical sounds, and there were moist râles at the base of both lungs. Marked greenish yellow expectoration. Coughing was about the same day or night. She slept at intervals in a chair, fearing the bed on account of a choking sensation. She had coughing spells, lasting from ten minutes to two hours, terminating in a desire to vomit, but she did not vomit, except occasionally in the morning. She always felt cold, had crying spells, suffered from hoarseness occasionally. Urine, on several examinations, was negative; sputum, three examinations, negative to tubercle bacillus. A culture from the nose and throat, and sputum was full of pneumococcus, staphylococcus, pyogenes aureus, the streptococcus hemolyticus and the influenza bacillus. Blood pressure was 180 to 160 systolic, and from 120 to 100 diastolic. There were no abnormalities in the nose and throat and no cardiac murmurs. The patient had ninety skin tests with the following results: Ragweed short plus four, ragweed giant plus four, timothy plus three, corn

plus one, and daisy plus one; doubtful to sunflower, goldenrod and to the proteins of wheat, potato and rye. I should like to remark, at this point, that this patient, though being strongly positive to timothy pollen, which is considered a spring pollen, had never had spring rhinitis, or so-called rose fever.

The patient was given desensitizing injections and after the first week was free from asthma and kept well for two months. On retesting, she was found to be still positive to the two ragweeds. Desensitization was continued for two more months and when retested the third time she was found to have no more positive reactions.

Suspecting some endocrine disturbance, ovarian extract and corpus luteum, of each five grains, were given in a capsule with good results. She still had an occasional attack of asthma once a week or once every two weeks. Her pulse varied from 120 to 130, and no medication would bring the rate down. She refused to stay in bed. I consulted a cardiac specialist and his opinion was that the high pulse and high blood pressure might possibly be due to the oncoming menopause. On March 1, 1921, the patient had a severe attack of angina and was put to bed for three weeks. Her pulse went down to 68 and is now about 90, for the first time in six months.

Summary.—Pollen intoxication, glandular disturbance, possibly of ovarian origin; a possibility of tuberculosis, although no tuberculosis was demonstrated by the x ray and the sputum was negative repeatedly.

CASE II.¹—Mrs. M. W., of Philipsburg, N. J., thirty-six years old, married six years; two children, five and two years respectively; had had no miscarriages; menstruation normal. She had had measles in childhood and pneumonia eight years ago. Grandmother on her father's side had asthma at forty years for a number of years.

The patient had had asthma for fifteen years, all the year round, but for the last four years she had been free from May to September, but from September to May the asthma had been very bad. The attacks were irregular throughout the year and were getting worse with each childbirth. It started during a cold summer when she contracted a cold. The paroxysms were the same day or night, with a yellow, frothy expectoration. Attacks were preceded by rhinitis and sneezing, with dyspnea on the slightest exertion, marked cyanosis, and cold perspiration. The patient's appetite was good. There was a great deal of belching and constipation, with offensive stools. She had no knowledge of any animal or pollen sensitiveness. She had many times walked through fields without any bad effects, but thought that milk, onion and cabbage made attacks worse. She had taken large doses of morphine for some time, the only medicine, she said, which made her comfortable. No abnormalities in the nose and throat could be detected. Urine, several examinations, was found negative, and sputum, after several examinations negative to tuberculosis. Blood pressure was 100 systolic; 70 diastolic, with

some variation on different examinations. There was marked cardiac dilatation with feeble heart action and weak radial pulse. A mitral systolic murmur, of a blowing type, was not transmitted. From ninety skin diagnosis tests, she was found positive to streptococcus hemolyticus plus one, sweet potato plus one, and doubtful to the proteins of oyster and orange and to the pollens of red top and timothy.

The patient was referred to her family physician, F. A. Wolf, of Philipsburg, N. J., with the suggestion that she be put to bed for two months, to improve the heart muscle, and also to inject stock vaccine containing streptococcus hemolyticus for the purpose of giving the physician a chance to watch the patient, rather than expecting any curative effects from the stock vaccine. Digitalis, bromides and arsenic were prescribed with other minor suggestions. She improved wonderfully and in December, 1920, Dr. Wolf wrote me that she was doing well. She had not had an asthmatic attack during the past four weeks. He had examined her chest and found her lungs clear, no râles of any kind. The first heart sound was a little weak, but otherwise she was in good condition. At present she is walking around, attending to her home duties and is feeling quite well, except for an occasional precordial pain.

Summary.—This patient apparently was not sensitive to pollen. No abnormalities in the nose and throat could be detected, although rhinitis and sneezing always preceded her asthmatic attacks. The plausible diagnosis in this case is: Marked cardiac dilatation without hypertrophy, a mitral systolic murmur, possibly due to the cardiac dilatation, because it was not present three months later when she called for relief from the precordial pain that she experienced occasionally.

CASE III.—Miss C. B., a native of Philadelphia, aged eighteen years. She was employed in an office but had never worked a full week. Her family history was negative. She had had measles in childhood and asthma since infancy. She was treated for worms up to the age of twelve, when a physician informed the parents that she had asthma. She had always been weak, suffered from dyspnea on exertion, and had been troubled with rhinitis and attacks of sneezing, which were worse in the fall and throughout the entire winter, but were usually better in the spring. Last spring, however, the attacks were very bad. They came on at two or three o'clock in the morning, and were accompanied by dyspnea and choking but very little cough. The attacks also came on when she was excited or when laughing heartily. The patient was well built, five feet five inches in height, and weighed one hundred and forty-five pounds. Menstruation was normal; urine negative; sputum negative; blood pressure 120 systolic, 85 diastolic. She had a deviated septum with spurs and was sent to a rhinologist for a submucous resection, but there was no improvement in the paroxysms. From one hundred skin tests she had a positive reaction to ragweed (short) three plus, and goldenrod one plus. Desensitization was made with a stock extract containing ragweed, goldenrod and corn. The patient improved wonderfully and for the next six months, for the first time in her life, she worked every day. On retesting, she was

¹ This patient called to the office since reading this paper. There was a return of the asthmatic prooxysms, in a much milder form, possibly due to a pregnancy of four months.

found to be negative to ragweed and goldenrod, but positive to corn one plus, to which she was not positive originally. I mention this fact because it is contrary to the impression that polyvalent pollen extracts may be used with impunity. This patient is still having attacks once in three or four weeks, though they are mild and are probably due to the acquired sensitiveness to corn extract which she showed on further retestings.

CASE IV.—Mrs. H. C., a native of Philadelphia, aged forty-six years. She was married fifteen years ago, had had no children, and no miscarriages. The menopause occurred one year ago. She had had whooping cough twice, once at the age of five and again at twenty-five. She had also had influenza twice, in the last attack spitting up blood for one night, and had had pneumonia two years ago. Her father had had asthma for twenty-five years and died of Bright's disease at the age of fifty-five. The patient had had asthma for thirteen years, but never had had hay fever, rhinitis or sneezing. She was unable to walk more than a block at any one time on account of dyspnea on exertion. The attacks were worse at night around two o'clock in the morning, and last year she was worse in September. The patient said that she did not notice any sensitiveness to grasses or plants nor to any animal emanation, but she had observed that potatoes, milk dressings, rice pudding and vegetable soups made her attacks worse. She had suffered from disorders of the stomach for a number of years with belching, regurgitation of a good deal of sour mucus, bloating after meals, vomiting after breakfast, globus hystericus, and so on. She had had osteopathic treatment three times a week for six months.

The patient was well built; height five feet four inches; weight one hundred and fifty pounds; temperature 99.5 degrees; pulse 100; heart enlargement downward and to the left, no murmurs, cardiac sounds not distinct; no abnormalities in nose and throat; urine negative on several examinations; sputum negative to tubercle bacilli on two examinations; blood pressure systolic 125, diastolic 75, with slight variations under different occasions. We made about one hundred skin tests on the patient and found that she reacted to ragweed (short) three plus, goldenrod one plus, corn one plus and the proteins of onion, rice, beef and celery, each one plus.

Patient was given desensitization injections and at the time advised to abstain from the foods to which she had a positive reaction. After two weeks no paroxysms occurred and at present she experiences merely a slight dyspnea on exertion due to the presence of myocarditis, otherwise she is well. Practically all her stomach trouble improved when the proteins mentioned above were removed from her diet. When retested, after eighteen desensitizing injections, she did not react to the pollens to which she had originally been positive.

CASE VI.—Mr. G. A. R., a native of Pennsylvania, musician by profession. He had been married nine years, he had one child, and his wife was well. Family history was negative. The patient

had had influenza and pneumonia two years before and measles and whooping cough in childhood. He had suffered from asthma for the past twenty years, the attacks being worse at night. He felt badly in the winter but was worst in September. He was using a proprietary inhalation which gave him some relief but carrying the inhalation apparatus constantly with him was inconvenient. The asthma attacks were made worse by exertion, stooping down, and contact with horses. He was unable to assist his father in his shoe store as contact with the farmers would cause a severe attack of asthma. While a boy he was around horses a good deal but never noticed any ill effects until about twenty years ago. He had been getting worse since.

From one hundred tests the patient was positive to horse dander four plus; horse serum four plus; almonds two plus; hickory nuts one plus; doubtful to parsnip, buckwheat and peach. The patient was given desensitization injections of horse dander. Mild and severe reactions interfered with his regular attendance, but gradually increasing doses were kept up for five or six months with very little improvement. The patient was retested every two months and he gave about the same reactions to horse dander and horse serum as he had originally. He stated that he had never had antitoxin injections nor had he, to his knowledge, ever eaten horse meat, but the persistent reaction to horse serum could not be ignored, especially when he did not improve on horse dander desensitization although strong dilutions were used.

We obtained his consent to further injections of horse serum, starting with one twentieth of a drop, gradually increasing to one drop, then suddenly increasing from one to two drops. This was followed by a marked local reaction. The arm was swollen from the tip of the fingers to the shoulder, but there was no marked constitutional reaction. The swelling subsided in from seven to ten days. Exercising great care, but disregarding the swollen arm which invariably followed each injection, in the course of three months the dose was gradually increased to five drops which was injected subcutaneously in the inguinal region. The local reaction was very marked and the patient was unable to walk for a week or more. This patient presented apparently a case of true anaphylaxis where the interaction of anaphylactic antibodies and specific anaphylactogens produced an acute hyperemia of the skin where the injections were made. (Kolmer.)

To make a long story short, the patient had noticed a disappearance of the asthmatic paroxysms following horse serum desensitization. This was apparently a case of horse asthma in which the patient gave a reaction of four plus to horse dander and horse serum, did not improve on horse dander desensitization alone, but on the addition of horse serum the results were better. Hence, desensitization should be more specific.

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¹ An additional case (V) cited by the author will appear in his reprint.

The Endobronchial Treatment of Bronchial Asthma and Asthmatic Bronchitis

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The purpose of this paper is to report the appearance of the bronchi in cases of bronchial asthma and asthmatic bronchitis and the results of treatment by topical applications to the bronchi in such cases. Galebsky reports redness and swelling in one section of the bronchus. Horn reports a spasmodic stenosis simulating scar formation which on subsequent bronchoscopy was not found. Jackson observed in two cases during attacks of asthma that the mucous membrane of the bronchus was purple and not red, no stenosis being evident, and the bronchi were filled with secretions. Freudenthal reports the appearance of a scarlike mass closing the entire bronchus. This was overcome by applications of twenty per cent. cocaine solution.

In 1910 Ephraim reported one hundred and three cases of asthma treated endobronchially with a spray of suprarenin and novocaine. Ultimate results were known in eighty-eight cases. The result in seventy-three was reported as good, in forty-eight of which the patients were free from recurrence, some of them for a period of one and a half years. In seven cases the attacks were lighter and occurred with less frequency. Horn, in 1910, reported a case of asthma in which five bronchoscopies were performed, using each time a twenty per cent. solution of cocaine with a few drops of epinephrine. The result, as he reported it, was far from satisfactory. Freudenthal, in 1911, reported the results of the treatment in thirteen patients, eight of whom he considered cured, three improved, and two not benefited; but I believe that since then Freudenthal has revised his opinion regarding the number of cures, being less than he had first thought.

The foregoing workers dealt entirely with the endobronchial picture and the treatment of the condition in the bronchi and apparently did not make an effort to uncover the etiological factors concerned in the production of the symptom complex called asthma, except probably in so far as intranasal or throat disease was concerned.

All of the thirteen cases herein reported have been tested for skin sensitiveness with one hundred and nineteen proteins consisting of bacterial, epidermal, and food proteins. When indicated they were tested with pollens. Nose, throat, and teeth examinations were made and the pathological conditions found were eradicated wherever possible. Radiographs were taken of the lungs and when necessary of the paranasal sinuses. Complete bacteriology of the nasal secretion, tonsils, teeth, sputum, and stool was attempted and the patients tested for skin sensitiveness with suspensions of the various bacteria isolated. In the majority of these cases the urine was examined for possible evidence of nephritis and the blood for Wassermann reaction and uric acid content. A short résumé of each history giving the abnormal findings and treatment will be presented. In the cases where no skin sensitiveness was elicited

epidermal, food, or pollen proteins, although the patients were found sensitive to bacterial proteins or autogenous bacterial suspensions, they were considered as cases of asthmatic bronchitis, whereas those sensitive to epidermal, food or pollen proteins were considered to be cases of bronchial asthma.

ASTHMATIC BRONCHITIS.

CASE I.—Mr. J. R., fifty-six years of age; sick for thirteen years. He complained chiefly of dyspnea, cough, constant expectoration, and general weakness. Attacks were perennial. Radiograph of chest revealed the bronchial shadows to be very well defined throughout, especially at the bases. Sputum revealed the presence of *Streptococcus nonhemolyticus* and *Staphylococcus aureus*. Bronchoscopy showed the mucous membrane of both primary bronchi to be intensely red and swollen, with large quantities of thick mucopurulent sputum exuding from all secondary bronchi. He was treated with adrenalin one to one thousand solution, silver nitrate ten per cent. solution, a mixture of menthol and guaiacol two and five tenths per cent. each in sweet almond oil, 1.5 c. c. of which was deposited in both main bronchi. The condition was considered hopeless and no further treatment was given.

CASE II.—Mr. M. G., sixty-one years of age, sick seven years. He complained chiefly of dyspnea and expectoration, which were worse about seven o'clock in the morning when he arose. He was worse in the winter. He had pyorrhoea alveolaris and chronic ethmoiditis on the left side. Radiograph of the chest revealed the bronchial shadows to be intensified throughout the chest, especially at the bases. In addition there were several places in the right and left lung just external to the hilus which gave evidence of peribronchial fibrosis. Sputum revealed the presence of *Bacillus mucosus capsulatus* and *Bacillus influenzae*. From the teeth *Streptococcus hemolyticus* was isolated. A vaccine containing *Bacillus influenzae* and *Bacillus mucosus capsulatus* was given. Most of the injections were given subcutaneously and a few intravenously, twenty-four in all, without the slightest amelioration of his symptoms.

Bronchoscopy revealed the presence of large quantities of grumous, mucopurulent sputum issuing from all secondary bronchi. The patient was bronchoscoped three times at intervals of about one week each and at each time he was treated with ten per cent. solution of silver nitrate and five c. c. of orthoform and tannic acid mixture was deposited in each main bronchus. He did not improve, however, and death finally ensued due to general debility and exhaustion.

CASE III.—Mrs. A. C., sixty years of age, sick three years. She complained chiefly of attacks of shortness of breath, cyanosis, and wheezing which were likely to occur at any time during the day or

night. These attacks might recur once or many times during the day. The patient was made worse by mental anxiety and worry and acute infections of the upper respiratory tract, and she was worse in the winter, though attacks occurred in the summer also. She demonstrated no allergy. X ray of the chest revealed some old healed foci in both upper lobes. X ray of the head showed that the frontal and sphenoidal sinuses were absent. The antra were small and partly cloudy. Nasal examination revealed a bilateral chronic ethmoiditis and polypi. *Streptococcus hemolyticus* and *Staphylococcus aureus* were isolated from the sputum. Thirteen doses of a vaccine of these were given.

On December 21, 1920, bronchoscopy showed the mucous membrane of the left bronchus pinkish white and stippled with small red areas. Mucus was exuding from its lumen which was contracted and it was impossible to pass the tube except for about half the distance. The right bronchus was normal. The mucous membrane of the left bronchus was treated with ten per cent. solution of silver nitrate and five c. c. of orthoform and tannic acid mixture were deposited in its lumen. After this the patient remained free from symptoms for a little over six weeks, when, after a great deal of worry incident to business and the contracting of a severe cold in the head, her asthmatic attacks returned slightly and gradually increased in severity until on March 3, 1921, she was bronchoscoped during an attack. The left bronchus was found to be entirely occluded and its mucous membrane intensely red and swollen. After using one in one thousand adrenalin solution freely on the mucous membrane of the left bronchus, it was completely opened and the attack of asthma stopped. The mucous membrane was swabbed with a ten per cent. solution of silver nitrate and five c. c. of the orthoform and tannic acid mixture deposited in the left bronchus.

During all this time the patient was receiving vaccine every four or five days, when about March 20, 1921, an abscess of the left arm developed. This proved to be an infection from the vaccine, which had evidently not been sufficiently sterilized, as the same organisms were found in the abscess which were incorporated in the vaccine. The patient was very sick and was constantly having attacks of asthma, which ceased after the abscess was opened, except for an occasional attack. She has been very comfortable up to the present writing.

CASE IV.—Mr. J. P., fifty-two years of age, ill six years. He complained of obstructed breathing, attacks of coughing, dyspnea, and expectoration, which were worse in the winter. He had a deviated septum. Radiograph of the chest revealed a moderate infiltration and retraction in both apices (old healed lesions); aorta moderately atheromatous; paranasal sinuses and head normal. He was slightly allergic to stock *Streptococcus nonhemolyticus* protein. A specimen of sputum was not procurable. Cultures from the nose revealed nonhemolytic streptococcus and *Staphylococcus albus*. The patient was found to be slightly sensitive to autogenous suspensions of *Staphylococcus albus* but not to be *Streptococcus nonhemolyticus*. Fourteen doses of a vaccine of these were given.

Bronchoscopy revealed occasional red areas in the trachea; the left bronchus constricted in its lower portion; the mucous membrane of the right bronchus thickened and roughened, with areas of scar formation. The mucous membrane of both bronchi could not be shrunken entirely by adrenalin. Treatment consisted of ten per cent. silver nitrate solution applied to the inflamed areas and about five c. c. of orthoform and tannic acid mixture deposited at the bottom of each main bronchus. The patient was much improved but not cured.

CASE V.—Mr. M. L., twenty-nine years of age, sick six years. He complained chiefly of cough, expectoration, and heaviness in the chest, and felt worse in the winter time. He had enlarged middle turbinates and mucus dripping from the nasopharynx. An examination of the sputum revealed the presence of *Staphylococcus aureus* and the pneumococcus. He was very sensitive to autogenous suspensions of the pneumococcus.

Bronchoscopy showed red patches in the left bronchus and mucus exuding from all secondary bronchi; right bronchus constricted in its lower portion, and mucus exuding from all secondary bronchi. Treated with adrenalin, one in one thousand solution, silver nitrate ten per cent. solution, menthol and guaiacol two and five tenths per cent. each in sweet almond oil, followed by five c. c. of orthoform and tannic acid mixture deposited at the bottom of each main bronchus. Following this treatment he felt very badly for a few days, probably due to the irritating effect of the menthol and guaiacol mixture. After this the patient declared the heaviness in his chest was much relieved and he was able to cough up the sputum with greater facility. Two and a half months later the patient was again bronchoscoped and mucus was found only in the left bronchus. Upon opening one of the secondary bronchi it was found swollen and red and mucus was exuding from it. Treatment consisted of silver nitrate application to the inflamed secondary bronchus followed by orthoform and tannic acid mixture. Following the bronchoscopy the patient said that he felt much improved.

CASE VI.—A. K., male, ten years of age, sick three and a half years. He complained chiefly of coughing, expectoration, dyspnea and cyanosis, which were perennial. Sputum examination revealed the presence of *Bacillus diphtheroideus*. Fourteen doses of a vaccine of this organism were given. Bronchoscopy was performed for diagnostic purposes mainly and treatment incidentally. It was done under ether anesthesia. The left bronchus was normal in appearance, and the right bronchial mucous membrane was swollen and intensely red. The lumen was much smaller than normal and contained a good deal of mucopurulent sputum. After adrenalin was applied the lumen assumed its normal size and large quantities of mucus exuded from all of the secondary bronchi. The mucous membrane was swabbed with a ten per cent. solution of silver nitrate and five c. c. of orthoform and tannic acid mixture deposited in the lumen of the bronchus. The condition of the patient improved remarkably after this treatment but he still suffered from mild attacks.

BRONCHIAL ASTHMA.

CASE VII.—Mr. W. H. C., sixty-one years of age, sick eighteen months. The patient complained chiefly of eczema, cough, expectoration, and dyspnea. He was allergic to crab and lobster. Dr. Selian Neuhoof reported the heart to be normal. Traces of albumin and a small number of hyaline casts were found in the urine. Blood revealed 3.5 mgm. of uric acid to 100 c. c. The patient's teeth were in bad condition. From his sputum were recovered pneumococcus and Staphylococcus aureus. Two series of fifteen doses each of vaccine of these organisms were given. He was bronchoscoped four times, on September 15, October 15, and November 15, 1920, and on January 2, 1921. At the first bronchoscopy mucopurulent sputum issued from both bronchi. The left bronchus was red and swollen and dilated at about its bifurcation where it was lined with a grumous exudate. This area was treated with a ten per cent. solution of silver nitrate and five c. c. of orthoform and tannic acid mixture was deposited in both bronchi. At each subsequent bronchoscopy the condition of the bronchi gradually improved, so much so that when he was bronchoscoped last the exudate in the left bronchus had entirely disappeared and the dilatation was found to have narrowed. Since then the patient has been entirely well.

CASE VIII.—Mr. N. D., thirty-eight years of age, sick eighteen months. The patient complained chiefly of dyspnea, cough, and expectoration, aggravated by colds in the head. Condition was perennial. He was allergic to chicken, clam and chestnut. From the sputum were recovered Staphylococcus aureus and Streptococcus viridans. Twenty-one doses of a vaccine of these organisms were given. Notwithstanding the vaccine the patient continued to present symptoms until December 6, 1920, when he was bronchoscoped. The mucous membrane of both bronchi was found to be swollen and red, particularly the left, and thick mucus poured constantly from all the secondary bronchi. He was given the usual silver nitrate and tannic acid and orthoform treatment. On December 27, 1920, he was again bronchoscoped and mucus poured from the right bronchus in fairly large amounts, while the left bronchus was apparently normal except that the mucous membrane of one secondary bronchus was red and swollen. This patient had been entirely free from symptoms since the last bronchoscopy and in a letter which was received from him about May 1, 1921, he said he was entirely well.

CASE IX.—Mr. V. T., thirty-five years of age, sick fifteen years. The patient's illness began with fall hay fever and finally, a few years ago, dyspnea, cyanosis, cough and expectoration developed, which continued throughout the winter. He was allergic to potato and ragweed and goldenrod pollen. From his sputum Streptococcus nonhemolyticus and Bacillus influenzae were isolated. He was found to be exquisitely sensitive to an autogenous suspension of influenza bacillus. He was bronchoscoped on February 11, 1921. The mucous membrane of the left bronchus was reddened and moderately swollen and a small quantity of mucus exuded from it. On touching the mucous membrane of the bronchus it bled readily. The right bronchus was normal.

Treatment consisted of applications of ten per cent. solution of silver nitrate, adrenalin one in one thousand solution, 1.5 c. c. of menthol and guaiacol 2.5 per cent. each in sweet almond oil and five c. c. of orthoform and tannic acid mixture. The symptoms continued, but with less severity, and on February 18, 1921, he was again bronchoscoped. The mucous membrane of the left bronchus was found to have a granular, reddish appearance and a small quantity of mucus exuded from one of the secondary bronchi. The treatment consisted of the usual silver nitrate solution and the orthoform and tannic acid mixture. The patient has been well up to the present time but it is too early to come to definite conclusions as he has not been treated for hay fever.

CASE XI.—Mrs. A. A., fifty-five years of age, sick three years. The patient complained chiefly of dyspnea, cough, and slight expectoration, worse in winter. She was allergic to dog hair, chicken feather, goose feather, crab, and veal. Radiograph demonstrated heavy bronchial shadows; sputum was not obtainable. Bronchoscopy showed the left bronchus swollen and red, with mucus exuding from the secondary bronchi; right bronchus normal. The patient was treated with the usual silver nitrate and orthoform and tannic acid mixture. No further treatment was given and the patient has felt entirely well for the last six months.

CASE XII.—Mr. M. I., sixty-three years of age, sick twenty years. He complained chiefly of dyspnea, cough, and expectoration. For the past three years he had had attacks of coughing and expectoration every two or three hours, which were perennial. The patient was allergic to goose feathers, rabbit hair, lima bean, oat, pecan, pineapple, turnip, almond, cabbage, chestnut, cucumber, cantaloupe, lentil, and tobacco. He had a chronic ethmoiditis on the left side which was treated surgically. Radiograph of the chest revealed the hilus and bronchial shadows to be much accentuated. On the right side the increase in density of the bronchial shadows extended to the base and on the left side, especially in the first and second interspaces. There was a suggestion of adhesions at the cardiophrenic angle on the left side. From the sputum Streptococcus nonhemolyticus, pneumococcus and Staphylococcus albus were isolated. Fifteen doses of a vaccine consisting of Streptococcus nonhemolyticus and Staphylococcus albus were given. On February 5, 1921, bronchoscopy revealed red areas in both bronchi and pearls of mucus adherent to their sides. Secondary bronchi were reddened and mucopus exuded from most of them. On March 12 and April 23, 1921, bronchoscopy revealed right bronchus apparently normal; mucous membrane of left bronchus red and swollen and mucopurulent sputum exuded from all secondary bronchi. The usual treatment was given in each instance except the last, when in addition 1.5 c. c. of a four per cent. solution of antipyrine was instilled into the bronchus. The patient continued to improve up to about the middle of March when he contracted a severe cold which increased his bronchial secretions and left him in the same condition that he was before treatment was instituted.

¹ The report of Case X will appear in the author's reprints.

CASE XIII.—Mr. A. K., forty-two years of age, sick fifteen years. The patient complained chiefly of shortness of breath, cough and expectoration, especially at night. Two paternal aunts had had asthma. He had a cat and a dog in the house. He said that for the past fifteen years he had had hay fever during August and September. He was allergic to dog hair and lettuce. The dog was disposed of November 3, 1920. From his sputum was recovered pneumococcus and Staphylococcus aureus, fifteen doses of a vaccine of which were given. The patient continued to have more or less severe attacks of asthma whenever he contracted an acute rhinitis and on November 15, 1920, he was bronchoscoped. Red velvety areas were found in the lumen of the trachea about the carina and at the bifurcation of the primary bronchi. Pearls of tenacious mucus were found attached to the mucous membrane of both bronchi. The inflamed areas were treated with a ten per cent. solution of silver nitrate and five c. c. of the orthoform and tannic acid mixture deposited in both bronchi. On December 20, 1920, he was again bronchoscoped, whereupon the mucous membrane of the right bronchus was found to be slightly congested, otherwise the findings were normal. The same treatment was given as in the first bronchoscopy.

After this he remained free from symptoms until about the early part of May, 1921, when an acute rhinitis and bronchitis developed followed by difficult breathing, and on May 11, 1921, he was again bronchoscoped. At this time the mucous membrane at the carina was reddened and the mucous membrane of both bronchi congested, pearls of mucus hanging to their sides. A small ulceration was found at the branching of the right bronchus. He was treated with silver nitrate solution, ten per cent., a solution of four per cent. antipyrine, and orthoform and tannic acid mixture. The symptoms immediately subsided and the patient has been well since.

The great majority of physicians have an idea that, given a case of bronchial asthma in which the patient has been found sensitive to one or more proteins, upon the elimination of these proteins from his economy and environment the symptoms will disappear. This is undoubtedly true if the case is not complicated by chronic respiratory infection, but in most of the cases there is also a chronic bronchitis and that is the reason why failure to cure occurs in so many cases. Cases presenting a generalized infection of the bronchial tree with peribronchial changes, with or without allergy, are, so far as my experience goes, almost hopeless of relief or cure, as is shown in Cases I and II.

Factors that are not usually considered in the etiology of bronchial asthma, which to my mind are very important, are susceptibility of the bronchial mucous membrane to reinfection, habit, and the psychology of the patient, as is demonstrated in Cases III, VIII, and XIII. Whenever the patients acquired an acute nasal infection it was always followed by infection of the bronchi, with an aggravation or return of their symptoms. In such cases surely the bronchial mucous membrane is a locus minoris resistentiae. The constriction of the main bronchus in these cases is due either to a swelling

of the mucous membrane, to a spasm of the muscular coat of the bronchus which lies directly underneath the mucosa, or to a combination of both. Whether the spasm of the bronchial musculature is due to direct irritation at the site of infection or to reflex spasm from the upper respiratory tract, it seems quite reasonable to suppose that one or both factors may be operative. It is a well known fact that nerve pathways that are traversed constantly transmit impulses more rapidly and with greater facility than those which are occasionally used. This is demonstrated in piano playing and in other manual habit formed occupations. This may also apply in cases of bronchial asthma where the patients suffer from a recurrence of their symptoms while undergoing mental distress or following an infection in some other part of the body, particularly in the upper respiratory tract.

With these considerations in mind it is necessary that, whenever possible, patients should be free from worry and irritation. They should be instructed to avoid crowded places and especially to abstain from coming in contact with people who are suffering from respiratory infections. If their living quarters are poorly ventilated and devoid of sunshine, they should be changed. Vaccines of the predominant organisms found in the sputum or nasal discharges are of value, especially in those cases where the individual is sensitive to autogenous suspensions of these, with the exception of Bacillus influenzae. As was seen in Cases II, IX, and X,¹ vaccines of influenza bacilli had not the slightest effect in ameliorating the symptoms.

Endobronchial treatment is the most valuable procedure that we have at our disposal for treating cases of asthmatic bronchitis and bronchial asthma, where the elimination of the allergic substances and vaccine therapy, combined with the other measures suggested, have failed to produce the results desired. I am firmly convinced that astringents, such as silver nitrate and tannic acid, have not only the property of temporarily dilating the lumen of the bronchial tree but also, when applied often enough and at short intervals, say weekly, have the effect of rendering the mucous membrane less susceptible to infection. Unfortunately, it is not possible in every case to have the patient submit to weekly bronchoscopies as the procedure is trying and disagreeable. I have not made an attempt to treat the lumen of the secondary bronchi directly because I have felt that some of the orthoform and tannic acid mixture deposited in the main bronchus must find its way into the smaller bronchi by aspiration. There is no doubt that bronchoscopy is rather a spectacular performance, to the patient at least, and in that way may have a decidedly salutary effect upon the mind of the individual.

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Pollinosis, or Hay Fever

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In recent years the term pollinosis has come into general professional use to designate a widely distributed and prevalent disease, popularly known as hay fever, harvest catarrh, rose cold, autumnal catarrh, and vasomotor rhinitis. These titles either describe some symptom or have reference to one or another of the various theories held in regard to the etiology of the disease.

Examination of the older literature shows that clinicians had long observed manifestations of this disorder, but were confused in their interpretation, and classed such manifestations with a variety of other nasal affections. It was not until the nineteenth century that the disease was recognized, under the name hay fever, as a distinct pathological entity and segregated from all others. For this advance we are indebted to John Bostock, an English physician (1773-1840), who was himself a sufferer from the disorder, and who in 1819 published a monograph upon its clinical history; a monograph so comprehensive and accurate that subsequent writers have made no additions to the symptomatology therein given.

In 1873, Dr. Charles Blackley, of Manchester, England, using as a basis the study of his own case and the opinions current in his time regarding the causation of hay fever, demonstrated that the pollen of nearly all grasses and plants, either fresh or dried, was capable of producing the symptoms of this disease. He also showed that symptoms did not appear until a certain number of pollen granules were present in the atmosphere, and that the intensity of the symptoms was in direct proportion to the prevalence of the pollen granules. Blackley's admirable research was lost until 1903, when Professor Dunbar, of Hamburg, inspired by the success of the diphtheritic antitoxin, administered to horses a substance derived from the pollen of many plants, and then from the equine blood produced a serum called pollantin, which was given both as a preventive and as a cure for hay fever. This attempt to find a serum treatment being in accord with the trend of therapeutic investigation of the time, excited considerable interest and elicited some hopeful reports; but with the discovery of anaphylaxis and some of the laws governing its manifestations, the toxin-antitoxin theory of Dunbar was found to be fallacious. It was he, however, who demonstrated that the active principle in pollen was an albuminous body which could be extracted from the pollen granules by salt solution; although it remained for other investigators to show that the symptoms of hay fever were manifestations of hypersusceptibility in the individual to the albumen of certain pollens of flowering plants, floating in the atmosphere and reaching the nasal mucosa in the act of inspiration. The pollen, coming thus into contact with the sensitized mucous membranes, causes a local intoxication which results in irritation of the terminal nerve fibrils. In this way the symptoms of hay fever are developed.

During an attack of hay fever there is a peculiar form of intranasal inflammation with great vasomotor relaxation, so that bloodvessels are turgid, and there is edema, soreness, itching and profuse leakage of serum. The conjunctiva is affected in a similar way, presenting a bright red congested aspect, and there is copious lacrymation. The sensory nerves share in the disorder, becoming so hyperesthetic that irritation of the most trivial kind will excite violent and persistent sneezing. A psychic element is frequently present manifesting itself in a restlessness and irascibility out of proportion to the physical discomfort, great as that is. Persons whose selfcontrol is habitual, may, during an attack, display an excitability almost hysterical. Another sign of psychic involvement is the fact that at least some of the symptoms may be produced by subjective sensations. In sufferers from rose cold, the neural phenomena are excited by inhaling the fragrance of a rose; and some of these patients will sneeze violently if a rose, which they think natural, is brought close to their nostrils, although the flower may be artificial and devoid of odor.

Hay fever is especially prevalent in the latter half of August when the pollen of ragweed is most abundant, and gradually subsides with the passing of the season. In making a diagnosis of the disease, the season during which the symptoms occur should receive due consideration; as, for instance, rose cold occurs when roses are in bloom—the end of May and the month of June—although, strange as it may seem, hay fever is usually due to the pollens of the common grasses, rarely to the pollen of the rose.

As hay fever is prone to attack unhealthy mucous membranes, careful search should be made for any nasal lesion that may have proved a causative factor. Abnormalities of the septum should be corrected, hypertrophies of the turbinals reduced, and polypi removed. Hyperesthetic spots upon the nasal mucosa should be destroyed with chromic acid, or with the galvanocautery under local anesthesia. In addition, every effort should be made to build up the patient's health by the restriction of stimulants and excitants, and by the use of nourishing food, exercise, and a hygienic mode of life.

The best material for making the intradermal tests of hay fever is the dried pollen of each individual species of plant, which should be free from admixture with the granules of any other variety. With the point of a scalpel a slight scarification of the skin is made on the anterior surface of the forearm, care being taken that no blood is drawn. Place upon the scarified areas a drop of salt solution, and upon the drop of saline a small portion of pure pollen which should be carefully worked into the open scarification. Although the dermal reaction may take place within a few minutes, it is best to allow the pollen to remain for an hour, when it may be washed away without interfering with the result. When the reaction is intense, there is at the

seat of the inoculation a raised white centre resembling a bee sting, which is surrounded by a reddish areola measuring from one half to three inches in diameter. This reaction is accompanied by more or less itching and burning. Negative reactions may show an immediate area of redness but this does not increase and the positive tests act as controls.

When making an inoculation a careful record is kept of each variety of pollen used in every individual scarification. The positive tests show the pollens to which the individual is susceptible, and from them a vaccine of definite strength is exhausted. The dose is noted in terms of the protein nitrogen content of the extract.

The prophylactic treatment of hay fever is of paramount importance and may be begun two or three months before the expected attack. The initial dose of pollen protein nitrogen is 0.0025 mg., which will reduce some immunizing response without producing disagreeable effects. The subsequent doses are gradually increased until 0.02 mg. are reached; although in some instances larger doses are necessary to relieve symptoms.

The intervals between injections are usually from five to seven days.

During an attack of hay fever the injections of pollen extract are given daily in ascending doses

until relief is obtained. At this point the dose is usually about 0.02 mg. although larger amounts may be given, and from then on the intervals between injections are gradually increased until they are given from five to seven days apart. If the injections are required oftener than every five days the data upon which the diagnosis is based should be carefully reexamined. If the symptoms persist, notwithstanding a carefully reviewed diagnosis and specific treatment, injections of an autogenous bacterial vaccine should be alternated with the pollen extract. This vaccine should contain the bacteria found in the nasal fossa, and which may grow vigorously, exerting a toxic effect upon the mucous membrane whenever the secretion is modified by the irritating action of the pollen. The dose of this bacterine is gradually increased until at the point of injection a slight local reaction appears.

The results of treatment so far recorded have been highly encouraging. More than eighty per cent. of those treated have been entirely relieved or markedly benefitted by the specific injections. The immunity obtained is relative; that is, an overwhelming exposure to the pollen may produce symptoms, but as a rule they are much less severe and disappear more rapidly than those experienced by patients who have not been desensitized.

1627 WALNUT STREET.

A Few Meteorotelluric Observations

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In the vicinity of Buffalo last year, we had an unusually cool August, without the usual epidemic of heat retention hemolytic crises, as summer autumnal coryza, sunstroke, cholera infantum, cholera morbus, or summer eczema. Only a few cases occurred and these were very mild. Many persons escaped summer autumnal coryza, who for years had never before skipped an attack. Two victims escaped an attack of summer autumnal coryza last August for the first time, one in twenty-four years and the other in eighteen years.

August, last year, in the vicinity of Buffalo was windy, sunny, unusually cool, and visited by five electrical storms, occurring on the 7th, 9th, 13th, 17th, and 22nd. Also we did not have the usual August droughts, with their accompanying death of vegetation, thus adding another factor in causing a seasonally subnormal production of deleterious vegetation decomposition gases. Vegetation of all kinds, hay, grain, fruit, flowers, ragweed, and goldenrod, continued to grow as it never did before, and the growing vegetation absorbed much of the ground gases and also diminished the poisonous gases arising from the decomposition of vegetation.

According to my observations, the temperature has to be above 86° to produce heat retention hemolytic crises (1). During August, 1920, in Buffalo the temperature did not reach 86° and on no day

was there the usual August hemolytic combination, as: 1. Heat retention temperature above 86°; 2, cloudy; 3, high heat humidity; 4, stale, windless atmospheric stasis; 5, toxic ground gas accumulation; 6, diminished atmospheric magnoelectricity, elasticity, and absorption. The temperature was uniform and without any extreme variation between day and night temperatures, until August 23rd, when the cool nights began with a temperature of 48°, an extremely cool night for August.

This cool, windless, ground gas accumulating, humid, dewy, blood disintegrating night was followed by an epidemic of asthma and chills, with a mild, incapacitating, febrile reaction. The weather bureau report for the weather during August, taken from the newspaper, is as follows:

At 8 o'clock in the morning Buffalo not only held the "chill" record for the country, but also broke a record of forty-five years' duration for August 1st, and came within one half of one per cent. of being the coldest August 1st in the history of the local weather bureau. The temperature here at that hour yesterday morning was 53.5, the lowest for August 1st recorded in the country since 1875, when the mercury registered at exactly 53°. At the same hour yesterday all the proverbially cold cities of the continent were higher than Buffalo on the weatherman's chart.

The monthly meteorological survey for that month shows that the monthly mean temperature was 70.2°, which was a trifle higher than the average for the last fifty years. The mean maximum temperature was 76.5° and the mean mini-

mum was 63.8°. At no time was it particularly hot, since the highest recorded temperature was 84° on August 12th. The low mark for the month was made on August 1st and 23rd, with a temperature of 54°. It was, in fact, a month of remarkably uniform temperature, since the range was only about 30°.

The total precipitation in August was 1.77 inches, a trifle less than normal. The wind movement was light, totalling 8009 miles, an average hourly movement of 10.8 miles with a prevailing direction from the south. The highest velocity for any five minute period was forty-two miles from the southwest on August 30th. There were three clear, twelve partly cloudy, and sixteen cloudy days. The sunshine averaged fifty-five per cent. of the possible amount. It was, in fact, an almost perfect month so far as the weather was concerned.

This seasonally cool, magnetic, clear August, with an unusually low humidity, and its very decidedly beneficial effect upon the health of the community was personally observed in my general practice with a great deal of interest, as it confirmed my former observations and conclusions as worked out in the paper above referred to.

The summer autumnal equinoctial coryza and asthma season becomes epidemic when we have blood heat days or a day temperature above 86°, which tends to produce a heat retention blood disintegration, followed by chilly, dewy, foggy, humid, windless ground gas accumulating nights with a temperature below 60° with their blood disintegrating action. After the process of blood disintegration, capillary congestion, and skin or mucous membrane elimination and lymph, serum, mucous oozing, with their characteristic itching, burning, smarting, sneezing, wheezing, watery eye and profuse nose running is established, or an epidemic of summer autumnal coryza, it generally continues with exacerbations unless properly treated, until cool, windy, freezing weather sets in, or the proverbial first frost. This year has been an exceptionally bad year for coryza and asthma. During May and June when the ordinary or detectable meteorotelluric phenomena were fairly favorable, excepting the cool night ground gases from the day heated earth, we had an epidemic of septic sore throat, whooping cough, mumps, smallpox and more asthma than could be explained in any other way than due to blood disintegrating gases from the hobo comet. I heard a lecturer say before the Natural Science Society that the comets were surrounded by poison gases and he thought that no doubt some of our epidemics of influenza were due to poison comet gases.

From July 1st to July 24th the earth was encircled by a thin tentlike cloud close to its surface that held the heat and humidity to the earth like a blanket, and yet was so thin as only slightly to dim the sun. During this period the day temperature ranged between 84° and 88°, the night temperature between 66° and 76° and the humidity between fifty-eight and eighty-three. There prevailed a windless atmospheric stasis that permitted smoke and ground gases to settle to the earth morning and evening. As a result we had an epidemic of heat retention prostration, the end metabolic products being locked in by constipation, scant urination, dropsy, and dry skin.

On July 25th the thin tent cloud began to break up and form cirro cumulous clouds with blue sky between, and on July 31st the day temperature

dropped to 76°. The cool weather was probably due to the tent cloud breaking up to make formed clouds, showing the blue sky between, thus permitting the cooler strata of air that were held above the tent cloud to mix with the warm strata of air confined to the earth below the tent cloud.

On August 3rd the night temperature dropped to 56°, a chilly, humid, dewy, windless, ground gas accumulating, blood disintegrating night, and from this date our epidemic of summer autumnal coryza, asthma, cholera infantum, and cholera morbus started. From August 3rd to September 7th, of this observation, we had seventeen nights when the thermometer dropped to or below 60°, followed by hot day temperatures of from 80° to 82°, and summer autumnal coryza and asthma have been unusually epidemic and stubborn.

The blood disintegrating action of decomposing vegetation and mouldy grain gases has been very convincingly demonstrated in the sudden deaths of silo fillers; mouldy grain thrashers' chills and fever; and the war gas from decomposing mustard seed with its influenzalike blood disintegrations.

The summer and autumn of 1915 were so wet that the farmers had great difficulty in harvesting their grain without its moulding. The man on my farm, who was an inexperienced farmer, put the grain in the barn in a mouldy condition. I was at the farm when this grain was thrashed. The mouldy grain gas from the thrashing machine was very evident and after one day's thrashing five of the thrashing men had their blood disintegrated by the mouldy grain gas, giving them chills, fever, an influenza like coryza, and bronchopneumonia, or in other words they were gassed.

Growing vegetation absorbs carbon dioxide and ground gases and gives off blood stabilizing oxygen that is very beneficial to animal life, but dead, decomposing, and mouldy vegetation gives off carbon dioxide and other blood disintegrating gases that are extremely injurious.

Heat, or a temperature above 86°, in an arid atmosphere does not as a rule cause heat retention hemolytic crises or heat prostration, owing to the rapid elimination of end metabolic products through perspiration and evaporation. Heat, or a temperature above 86°, in a highly humid atmosphere or humidity above 70, often results in heat retention hemolytic crises, as heat prostration, sunstroke, and dropsy, and when a spell of weather of this character is followed by chilly, humid, dewey, ground gas accumulating, blood disintegrating night with a temperature below 60° or between 34° and 60° then after the blood disintegrates it dumps its disintegrated material through an exudative process that results in summer autumnal coryza, asthma, eczema, cholera infantum, cholera morbus, dysentery or vomiting, according to the line of least resistance.

The conclusions drawn from these observations are based on a study of 1,184 cases of summer autumnal coryza and asthma extending over a period of twenty-five years.

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Causes of Internal Hemorrhoids

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Internal hemorrhoids are varicosities of the superior hemorrhoidal vessels and arise entirely within the anus. They begin at the points of anastomosis between the portal and the caval systems. These anastomoses are numerous. The most common origin is at the level of the valves of Morgagni, about a half inch above the anal orifice, and from here they gradually extend up to the larger trunks and plexuses. Even normal veins are somewhat enlarged in this situation and are called glomeruli.

Hemorrhoids occur in two distinct types, the small capillary and the large venous.

A capillary hemorrhoid is a small tumor rarely larger than the end of the little finger and sometimes as small as a pinhead. It is an arterial *nævus*, spongy in texture and resembling a strawberry. Early in their existence, these tumors have a granular surface covered with a thin wall and are likely to bleed. Later, a plastic exudate and thickened areolar tissue covers the vessel, hemorrhage then occurring less readily. The gentlest examination or even the passage of the feces may be sufficient to start hemorrhage. I recall one case in which bleeding was profuse while the pile was found to be no larger than the head of a black pin. Excessive hemorrhage, particularly if spurting in character, is pathognomonic of capillary hemorrhoids. Frequently large amounts of blood are lost and a number of deaths have been recorded from this cause. Of course, a large capillary or arteriole is necessarily involved here.

This tendency to profuse bleeding makes a capillary hemorrhoid much more dangerous than the venous variety. In the palliative treatment this distinction is imperative, because the patient may be exsanguinated while the physician is temporizing with injections of styptics. The capillary piles do not protrude or cause any of the pain or discomfort, attendant upon the venous variety. Hemorrhage itself is the cardinal symptom and requires energetic or even heroic treatment.

The venous hemorrhoids are of more common occurrence than the arterial. The pile may appear as a good sized tumor, frequently a half to an inch across its base and covered with a livid bluish and glistening mucous membrane. Matthews reports seeing one as large as a small orange. These venous hemorrhoids are situated in the submucous connective tissue. They begin with venous pools and are composed of a dilated and varicose vein, with its capillaries, and also the arterial capillary supply. They are located, usually, one on each side of and slightly in front of the posterior commissure and on the right and sometimes left of the anterior commissure. Sometimes the whole anal ring is a mass of varicose veins, especially when due to diseases of the heart, liver or kidney, and this varicose condition may extend the whole length of the rectum and even to the colon.

Sometimes several small veins may be twisted together into one mass. The sacculations and varicosities are limited to the venous vessels and do not affect the arteries. The tumor is not wholly composed of veins but around this mass of vessels there is a fibrous capsule which sends trabeculae (partitions) in between the veins. The mucous membrane covering the pile is chronically inflamed and the walls of the veins are early thickened by this inflammatory hypertrophy; but later they are extremely thin, with nothing but an endothelial covering. Sometimes such vessels may form large venous pockets.

Internal hemorrhoids are brought on by anything that increases the local blood pressure. Man is the only animal assuming an erect posture during most of the waking hours. In this position, of course, a heavy column of blood must be lifted through these veins continuously for many hours. During our whole active life, there is the predisposition to the formation of hemorrhoids, and only some little local congestion or inflammation is required for the varicosities to develop. For this reason proctitis is a very common cause of hemorrhoids.

THE RELATION OF PROCTITIS TO HEMORRHOIDS.

Early in my work I noticed this association of hemorrhoids with proctitis. The acute catarrhal proctitis is often met with and always you will find an edematous mucous membrane with its hemorrhoidal vessels engorged. As the proctitis subsides, the hemorrhoidal edema and engorgement also is reduced and finally disappears. If, however, the proctitis persists as a subacute or chronic form, the hemorrhoids also continue and a gradual hypertrophy of the mucous membrane results. This increases the bulk and weight of the mucosa, which separates and slides down on the areolar tissue until it is grasped in the sphincter. The spaces of the submucosa about the hemorrhoid are filled with connective tissue. Later, when the proctitis reaches the atrophic stage, the hemorrhoids remain, because of this connective tissue infiltration which permanently constricts the venous overflow.

Now a second factor enters. The descending fecal mass, acting in the reverse direction on the veins, distorts the latter further and tears more mucosa from the muscular wall. With each bowel movement, the hemorrhoidal mass acts as an obstruction as the feces are forced through. This increased muscular action drags down the hemorrhoid and the adjoining mucous membrane until they prolapse, thereby increasing the size of the hemorrhoid itself. Finally when they have attained considerable size, they prolapse easily and act as foreign bodies tending to excite the sphincter.

CAUSES OF HEMORRHOIDAL CONGESTION.

Hemorrhoids brought on in the manner described are the result of digestive disturbances, the improperly digested or fermenting bolus acting as an

irritant. In this way, constipation is a frequent cause, while the vein is ruptured by the engorgement and stretching due to the passage of the feces. Thus it is that drugs used to relieve the constipation (aloes, senna, calomel, gamboge) also frequently congest the rectal circulation. Warm enemas also act in this manner. Certain articles of food, by irritating the mucous membrane, cause increased peristalsis or tenesmus and thus provoke hemorrhoids. (Notable among irritating comestibles are, spices, peppers, mustard, sauces, radishes, water-cress, tamales, chili con carne and pickles, also alcoholics and tea.) An excess of a carbohydrate diet that cannot be cared for by the liver, blocks the portal circulation and later the hemorrhoidal vein. These dietetic changes account for the apparent influence of the seasons upon the hemorrhoidal circulation. As the warm spring weather comes, the system cannot dispose of the same amount of carbohydrates as it had been accustomed to do during the winter, and so the load is thrown upon the portal circulation.

Besides constipation, there are other conditions that cause straining or a bearing down and thus tend to congest the pelvic venous current; among these,

particularly, are stricture of the rectum or urethra, stone in the bladder, an enlarged prostate gland, the pregnant uterus or a myoma of that organ, pelvic exudates, adhesions, even a retroverted uterus. It is well to bear each of these conditions in mind, because a patient may consult you when suffering from one of them, and, at the same time, complain of hemorrhoids. The hemorrhoids, however, do not require treatment directly, being wholly dependent upon the underlying condition. In this same manner, all those occupations that increase the abdominal or pelvic pressure will induce hemorrhoids, such as severe muscular exertion or prolonged standing or sitting still, especially if on a vibrating platform, as in the case of railroad men, or teamsters. Desk workers also frequently are sufferers, owing to sitting in a bent over position, which crowds the abdominal contents toward the rectum.

One other class of positive causes of hemorrhoids is disease of the heart, liver, or pancreas, and syphilis. Since the exciting cause in this class of cases cannot be removed there is no hope of curing the hemorrhoids and a tentative treatment is all that can be undertaken.

30 NORTH MICHIGAN AVE.

Acute Appendicitis in Inguinal Hernia

By ARTHUR WILDMAN, M.D.,
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CASE.—J. H. G., male, sixty-five years of age, gave a history of recurring attacks of pain and swelling in both inguinal regions, especially the left, for the past four years. He was advised by a physician to wear a double truss continuously. One day prior to the operation, the patient came to my office complaining of severe pain in the left inguinal region. Examination showed a soft swelling in both inguinal hernial regions. The mass on the right side was only slightly tender to palpation, and there was an expansile impulse on coughing, and a tympanic note on percussion. This mass was readily reducible by taxis, a distinct gurgle being heard on reduction. The mass on the left side, however, was extremely tender to palpation and not reducible by taxis. A lifting nonexpansile impulse was elicited on coughing and a dull note on percussion; intestinal peristalsis had increased, and the man was markedly constipated. He had vomited once, but no signs of shock were present. The abdomen was not distended, but was distinctly tender in the right iliac region. Pain over the mass on the left side was continuous and throbbing in character. Muscular rigidity, however, was entirely absent. The pulse was 78, temperature 99°, respiration 18. The blood count showed 7,800 leucocytes and eighty polymorphonuclears. The urine was negative.

In view of the salient feature of the case, namely, the extremely severe localized pain over the left inguinal mass, and its nonreducibility, the patient

was admitted to the hospital with a diagnosis of strangulated inguinal hernia.

Operation was performed under general ether anesthesia. An incision was made, commencing at a point half an inch above and somewhat external to the middle of Poupart's ligament on the left side and carried downward and inward to the spine of the pubes. This incision was carried through the subcutaneous fatty layer of the skin to the aponeurosis of the external oblique, the fibres of which were then divided over a grooved director, the inguinal canal being thereby laid open. A tense elastic tumor was exposed, embedded in a dense mass of fatty tissue. The spermatic cord was freed by blunt dissection and retracted. The sac was recognized by its bluish white color and by its gliding over the contained viscera. Its various layers were divided between pinched forceps. Lying upon the posterior wall of the sac was an acutely inflamed appendix, six inches long, bound down by a mass of adhesions. By blunt dissection the appendix was freed, its mesentery ligated, and the appendix then followed up to the neck of the hernial sac, which was tightly constricted about its base by dense bands. These bands were nicked with a blunt pointed scissors, introduced along the finger, and pointing directly upwards to avoid injury to parts, thereby freeing the neck of the sac.

Attached to the upper and inner surface of the neck of the sac was the cecum. Evidently the mesen-

teric folds of the cecum were directly continuous with the sac wall. It was therefore impossible to free the cecum completely and return it independently to its normal position in the abdominal cavity. The redundant folds of the sac were freed, tied off, and cut away while the remaining part of the sac was sutured to the cecum and returned to the abdomen. The peritoneal cavity was then closed with continuous No. 2 plain catgut, inserted in pursestring fashion. The free edge of the conjoined tendon was sutured to the reflected portion of Poupart's ligament below (the spermatic cord being kept out of harm's way by means of a strip of gauze), by five interrupted kangaroo tendon sutures, thereby forming a solid wall upon which the cord rested. The split margins of the aponeurosis of the external oblique were brought together with No. 2 chromic catgut, commencing above and running below to the external ring, being careful not to grip the cord too tightly at the lower angle. The skin was then sutured with silk. No drainage was instituted. The patient being in good condition, the regular Bassini operation for inguinal hernia was performed on the other side. Convalescence was uneventful.

A review of the cases reported in the literature of appendicitis in hernial sac reveals some very interesting data. Coley (1) reports a group of 1,874 inguinal hernia cases, in six of which appendices were found; and 140 femoral hernias, in seven of which the appendix was found. In a series of 100 cases reported by Wood, where the appendix alone was found in the hernial sac, eighty-one were in women, seven were in men, and the rest in children under fifteen years of age. Of the adults, over fifty per cent. were over fifty years of age. In a study of sixty-three cases reported by Gibbons, fifty-six were inguinal and seven femoral; of the inguinal, only one was in a female; the appendix alone being found in all the femoral, and in forty-one out of the fifty-six inguinal cases; while in the others, the cecum also was present in the sac. In another series of 145 cases by Spurrier and Cowen, seventy-one were inguinal and sixty-nine femoral.

In a series of 2,200 hernial cases operated in at the Hospital for Ruptured and Crippled between 1890 to 1908, ten appendices alone were found, eighteen with cecum, one with the sigmoid, and sixteen combined. In no case of femoral hernia was an appendix found. Abroad, at the clinic of Colzi, France, among 1,586 hernias operated upon, the appendix was found in twenty-seven cases. Doolin (2) reports a case of appendicitis in the femoral hernial sac where a diagnosis of strangulated femoral hernia was made, and an acutely inflamed appendix removed without drainage.

Mencke (3) describes the case of a young man, twenty-two years of age, who had had a hernia since infancy, thought at the time to be a non-descended testicle. On operation, when the sac was opened, an appendix was found, the neck of the sac reaching up to its junction with the cecum (as in my case). Schragger (4) describes a case of appendicitis on femoral hernia in a woman. Westbrook (5) also reported such a case in 1908.

In studying the etiology of this frequently

occurring condition one must remember the anatomy of the cecum. "The normal cecum is provided with a complete peritoneal investment, is movable, and has a mesentery which is short and serves to anchor it to the posterior abdominal wall" (6).

The layers of the mesocecum are but loosely adherent to each other and may be easily separated. As a result of this loose arrangement the cecum may slip down from between the folds of its mesentery and escape into the inguinal canal and form a hernia which is only partly provided with a sic. Since the appendix is more or less fixed to the cecum and to the posterior wall by its mesentery, when the cecum prolapses the appendix necessarily follows suit. This ordinarily occurs when excessive and continuous strain is placed on the abdominal muscles, or there is an increased intraabdominal pressure. A large internal abdominal ring would predispose to such a condition. The pressure of the contracting neck of the hernial sac upon the incarcerated contents, i. e., the appendix, gives rise to the extreme venous congestion and edema making an excellent medium for the ever present colon bacillus, resulting in an acute inflammatory process (7).

In a series of fifty cases reported by Tarnowsky (8) where the appendix could be reached and was removed during the course of the ordinary inguinal hernial operation, thirty per cent. of the appendices so removed showed pathological changes. One other distinct feature deserving comment was the marked tenderness in the right iliac region. Jones (9) (quoting Pottenger) states that no matter where the appendix lies, whether in the left side of the body or in the right, whether high or low in the abdomen, the natural place for the pain is in the right lower quadrant of the abdomen. "This is due to the nervous distribution in the abdomen, the motor cells sending fibres to the appendix being situated in the superior mesenteric ganglion." Therefore, reflexes from the appendix are transmitted to the abdominal wall in that region normally supplied by this ganglion and there is hyperalgesia through sensory afferent impulses. Aside from this right sided iliac tenderness there was also severe local hyperalgesia directly over the appendix in the hernial mass. This was due to reflecting afferent stimuli traced centrally through the lower dorsal segments to the overlying muscular tissues.

If drainage is required in acute appendicitis after the appendix has been removed, radical treatment of the hernia proper should be deferred until the acute inflammatory process has subsided, to eliminate a possible infection (10).

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The Combined Right Inguinal Hernia Appendix Operation

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The combined operation consists of removing the appendix through the hernial sac whenever a right herniotomy is performed. It has been performed

pendices will be encountered and removed. The only exceptions to its use are an acute emergency condition, such as strangulation, acute gangrenous

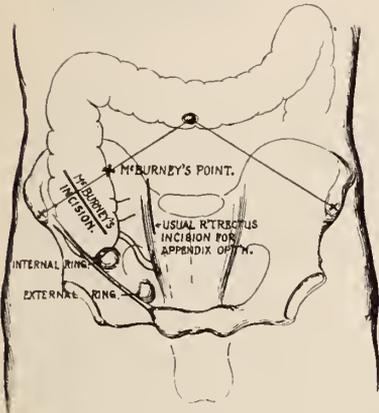


FIG. 1.—Shows the anatomical location of the cecum, appendix and internal and external abdominal rings. It also illustrates the location of McBurney's point, McBurney's incision, and the right rectus appendix incision.



FIG. 2.—Skin and superficial fascia incised by usual right inguinal hernia skin incision. Aponeurosis of external oblique exposed; also, external ring. Grooved director inserted through external ring under aponeurosis.

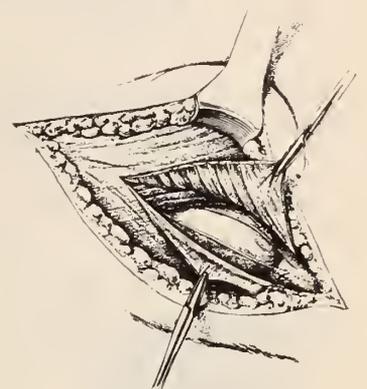


FIG. 3.—Aponeurosis incised. Ileoinguinal and ileohypogastric nerves exposed and protected. Muscular fibres of internal oblique visible. Reflected portion of Poupart's ligament visible in entire length.

by many surgeons for a long time and more recently on an increasing number of patients; I feel, however, that its application should be universal. Tarnowsky (1) in 1915 was the first to advocate the combined operation as a routine procedure in all cases.

There are many reasons for performing this combined operation, or poor physical condition of the patient.

Anatomically considered, "the internal abdominal ring is on a line midway between the anterior superior iliac spine and the pubic symphysis, and about half an inch above the inguinal ligament." "The cecum is situated in the right iliac and hypo-



FIG. 4.—Sac separated from the cord and exposed to the internal ring. Genital branch of genitocrural nerve seen on cord. Sac has been opened. In the female patient, the operation is even simpler.

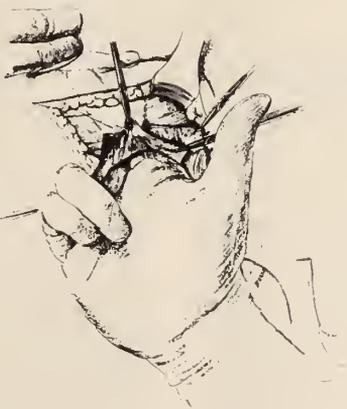


FIG. 5.—In this illustration the index and middle fingers of the right hand are inserted into the sac and the left hand is placed on the abdomen. By bimanual examination the appendix is located. If the neck of the sac is narrow, the index finger alone is inserted.

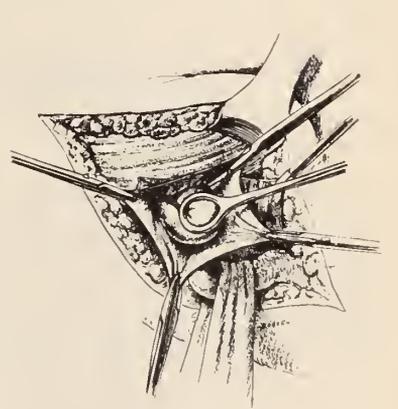


FIG. 6.—The appendix is grasped by a ring forceps and delivered through the sac. Where the least difficulty is encountered in locating or delivering the appendix, the cecum is mobilized into the sac. This is accomplished without any difficulty.

combined operation. It is easy of accomplishment, devoid of danger, requires little extra time, and by its routine exercise a large number of pathological ap-

pendices will be encountered and removed. The only exceptions to its use are an acute emergency condition, such as strangulation, acute gangrenous

gastric regions, just above the middle of the inguinal (Poupart's) ligament and behind the anterior abdominal wall," Gerrish (2). It can readily be seen



FIG. 7.—The mesoappendix has been ligated and cut. The appendix is then removed. The succeeding steps of the operation resemble that for an inguinal hernia operation.

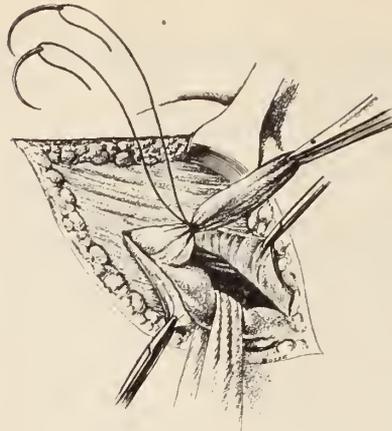


FIG. 8.—The sac is tied in the usual way. The ligatures are left long and each strand is threaded on a needle. The redundant part of the sac is excised.

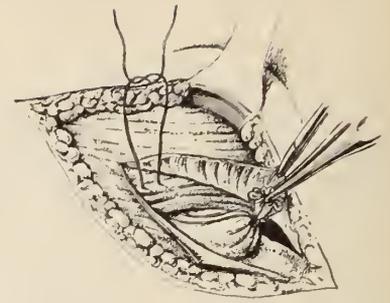


FIG. 9.—The neck of the sac is fixed high up by passing the threaded needles through the fibres of the internal oblique muscle.

that the appendix is proximal to the internal abdominal ring.

located and removed. The operation is then completed as for simple herniotomy.

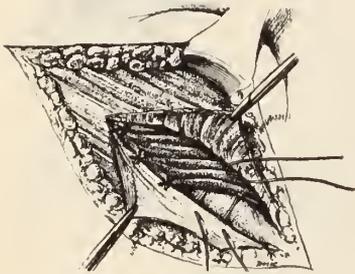


FIG. 10.—Shows the fibres of the conjoined tendon being sewed to the inguinal ligament. The Bassini is not followed but the modified anatomical operation.



FIG. 11.—Shows the divided aponeurosis of the external oblique being sewed up. The skin suture completes the operation.

TECHNIC OF COMBINED OPERATION.

Any method of inguinal herniotomy operation is utilized and after the sac is opened the appendix is

CONCLUSIONS.

To conclude, the combined operation is feasible and should be the routine in all right inguinal hernia cases. The removal of the appendix through the sac does not interfere with any of the herniotomy operations.

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221 SECOND AVENUE.

Strangulated Inguinal Hernia Reduced En Bloc*

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Reduction of a strangulated hernia *en bloc* means, taxis having been applied in an attempt to reduce the hernia, the sac has been torn from its normal position and, together with its contained strangulated viscera, has been displaced into the abdominal cavity.

CASE I.—Mr. C., aged fifty-four, seen with Dr. Cornell Smith, September, 1919. The family history was negative. The past history was negative except for complete right inguinal hernia for fifteen years. Has worn a truss during this time. The hernia had occasionally been scrotal but had always reduced easily by the patient lying on his back and applying pressure. The present illness began twenty-four hours before the patient was seen, the hernia came down into the scrotum, followed by immediate

pain in lower right abdomen and nausea. The hernia seemed harder and more tender than at any previous time. Lying down, the patient attempted reduction, at first without success, then by hard pressure he felt the hernia slip back. The pain was not relieved. Nothing had passed by rectum and he had vomited five or six times during the twenty-four hours.

Examination.—The chief complaint was a severe pain in the lower right abdomen, and nausea. The patient's color was pale, tongue coated, pulse 72, temperature 98, respiration 18. The abdomen was slightly distended, lower half of right rectus slightly rigid. There was no fluid in the flanks, no areas of dullness. The left inguinal ring was normal, right inguinal ring dilated to the size of two fingers,

*Read before Syracuse Academy of Medicine, February 1, 1921.

right inguinal canal empty. At upper end of inguinal canal a tense swelling could be felt. A diagnosis of strangulated hernia *en bloc* was made.

Operation.—Right rectus incision. Right inguinal region, extra peritoneal swelling about two inches in diameter, lying above Poupart's ligament at the site of the internal inguinal ring. The internal ring was small and firm and tightly constricted a loop of small bowel. The constriction was relieved by incision and the loop of constricted bowel drawn out. The loop was badly discolored and dull, but partially regained its circulation when surrounded by warm sponges. A finger introduced into internal ring entered a sac that could easily be pushed into the inguinal canal and to scrotum. The patient stood the anesthetic poorly, and no attempt was made at hernia repair, except to carefully close the internal ring. The recovery was normal. Examination a year after operation showed the patient still wearing a truss, and no recurrence of the hernia. Operation for radical cure was postponed by the patient.

G. A. Harrison (1), of the King's College Hospital, London, reports the following case:

CASE II.—C. C., aged forty-four, sudden illness February 5, 1917, severe pain in left iliac fossa, followed by vomiting. Bowels moved normally February 4th and by enema February 6th and 7th. Less severe attacks of a similar nature January 26th and January 28th. Double inguinal hernia for fifteen years. Three or four days before admission to the hospital the hernia came down. He reduced it and reapplied truss. February 7th, pulse 80, temperature 100.2° F., tongue furred, abdomen slightly distended. More resistance on left than on right side. In the region of the lower quadrant of the left rectus muscle there was a swelling the size of a tennis ball, tender, and resonant on percussion. No dullness in flanks. Operation February 7th through left rectus muscle. Ten inches of the small gut was found strangulated in a large sac, communicating with the peritoneal cavity by a narrow neck which was deeply situated. The constricting ring was divided, and ten inches of the gut resected. The sigmoid colon, with its mesentery, lay posterior to the swelling, which was immediately beneath the abdominal wall and was pushing the peritoneum lining the left iliac fossa toward the diaphragm.

H. H. Rayner (2), of the Manchester Royal Infirmary, reports the following case:

CASE III.—Female, aged forty-five. Three days previously the patient suddenly began to have pain in abdomen and right groin. She had never suffered previously from hernia. She had been seen by a doctor two hours after the onset of the symptoms, and a swelling the size of a small orange in right inguinal region had been found, with no impulse on coughing. The swelling was clearly a strangulated hernia, and by gentle manipulation was reduced. The reduction had been sudden and complete, like pushing a button through a button hole. Vomiting and pain continued between the time of reduction and when the patient was seen. No opiate had been given, as pain was not severe. The bowels had not moved. Examination, when seen

on the fourth day of the illness, showed the general condition good, appearance good, temperature 98.6° F., pulse 92, abdomen slightly distended and showing no evidence of peristalsis during observation for several minutes. On handling the abdomen a splashing sound could be heard, giving the impression of distended coils of intestines. Hernial orifice and pelvis normal. Laparotomy: Right rectus incision disclosed small intestine four inches in length, about thirteen inches above the ileocecal junction, tightly strangulated in a peritoneal pouch. The origin of the pouch was not at first clear, but it proved to be a direct inguinal sac displaced from the inguinal canal into the abdominal cavity. By dividing the orifice of the sac, the loop of strangulated bowel was easily released. At its point of entrance into the sac, the bowel showed a strip of gangrene which was covered over by invaginating suture. After closing abdomen, right inguinal canal was exposed and the sac pulled out into the canal and its relation as a direct hernia clearly established. Radical operation performed.

The following case was reported by Edmund Andrews (3), of the Mercy Hospital, Chicago:

CASE IV.—Strangulated umbilical hernia followed by abdominal pain and vomiting. Hernia of fifteen years' duration. Complete reduction had been made at 2:00 o'clock in the morning. At 7:00 o'clock that afternoon the patient was seen again. The pain and vomiting continued, with a history of reappearance of hernia shortly after reduction. A diagnosis of strangulated hernia *en bloc* was made. The sac was multilocular, containing chiefly omentum with one badly discolored loop of small bowel, which partially regained its color on relief of pressure. Radical operation performed, with recovery.

When an apparently successful reduction of a strangulated hernia by taxis has been made, and the pain, vomiting and shock do not immediately improve, no time should be lost in finding the cause of continued symptoms. Vomiting may continue for a time if an anesthetic has been given, but the pain is relieved. Other hernia openings should be examined carefully. Ruling out these, we know that the continued symptoms are due to the sac or viscera it contained; a ruptured sac without relief of constriction at the neck; pockets in the sac into which the still strangulated viscera has been pushed; displacement of the sac with its strangulated contents into the abdominal cavity; ruptured bowel pushed into the abdominal cavity; omental split, through which a loop of bowel has become strangulated, reduced into the abdominal cavity without relief of constriction. The results of constriction of the bowel, gangrene, ulceration and perforation, occur later, when general peritonitis and toxemia intervene.

If all strangulated hernia were operated upon and taxis never used, the mortality would be lower. Successful reduction by taxis, if it does not immediately relieve pain and vomiting, calls for surgical treatment. In the inguinal and femoral regions the best route is through the rectus on the side involved. Umbilical hernia are best attacked at the site of the hernia, enlarging the opening as necessary. First, relieve constriction and then repair damage

done by constriction. When resection of the bowel is necessary, the resection should be wide on the proximal loop. Baker, in the Oxford series, states that the change in the proximal loop depends upon the degree of constriction and duration. The pressure of the bowel contents causes early distention above the point of stricture. Bacteria multiply, early passing into the lower bowel wall, causing thrombosis of the smaller vessels. The bowel wall itself becomes congested and its muscles paralyzed, the extent depending upon the degree of obstruction. In this area of congested and paralyzed gut, anastomosis should not be done. Late perforation, due to stitches or ulcers, or a failure of the paralyzed portion of gut to expel its toxic contents, is almost certain to occur. To overcome these dangers, he advises pulling down the proximal loop, usually a distance of from one to five feet, resecting and doing an anastomosis at the site of normal bowel. Patients *in extremis* can be treated by bringing the gangrenous loop into the wound, attaching it to edges of

same and establishing a temporary fecal fistula at that point.

In four cases reported, pain, rapid pulse and vomiting were not severe enough to bear out the findings at operation. In all four cases the bowel was badly discolored. In one, resection, and in one, invagination, was necessary. Three had hernias of long standing, one immediately before strangulation. In no case did reduction relieve pain or vomiting. All cases presented total obstruction.

The dangers of taxis in reducing hernia are failure to relieve strangulation or injury to sac or viscera. Early operation should be done if taxis fails to relieve symptoms. If resection of bowel is necessary, a wide excision of the proximal loop is necessary in order to anastomose through healthy tissue.

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2. RAYNER, H. H.: *Ibid*, March 2, 1918.
3. ANDREWS, EDMUND: *Surgical Clinics of Chicago*, 1920. 461 SOUTH WARREN STREET.

An Unusual Foreign Body in the Rectum

By JOHN F. W. MEAGHER, M. D., F. A. C. P.,
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The following case of a foreign body in the rectum is reported because of two unusual features: First, the nature of the foreign body; second, the persistent refusal of the patient to aid any of the five physicians who had examined him to arrive at what would have been an easy diagnosis, though the patient was in great pain, and even in danger. This attitude was especially remarkable, in view of the apparent intelligence of the patient and the absence of any real psychotic phenomena. His reactions following the operation were also out of the ordinary.

I will briefly review the clinical picture as it was presented, rather than retrospectively, as this will show better the sort of a problem we had to deal with.

CASE.—The patient, A. A., male, twenty-four years old, a painter by occupation, was admitted to St. Mary's Hospital, Brooklyn, on March 20, 1920. He was rather uncommunicative, complaining only of severe pain in the midlumbar region. He laid stress on the fact that he had been treated for a twisted spine some time previous to the onset of this illness. This was strange, in view of our later findings. The orthopedic surgeon, who was asked to examine him by the house physician, found nothing, and referred him to my service for a neurological examination.

I examined him on the evening of his admission to the hospital. He was lying curled up in bed, and was evidently in great agony. He spoke in a low voice and kept his face averted most of the time. He told me that two years previously he had been operated upon for a stone in the bladder, at the Long Island College Hospital; this I was able to verify.

He had no bladder symptoms at this time. He said he had had the pain for two days before he called a doctor, but that his family had tried home remedies. His family physician, Dr. J. G. Glynn, a well known local physician, saw him twice and sent him to the hospital for diagnosis. The patient, of course, had hidden the facts from Dr. Glynn.

He told me that he had no idea as to the possible cause of his pain. He described it as being constant, severe and cramplike, situated in the midlumbar region, and radiating only slightly downward.

The neurological examination was negative. In the light of his scant history, I ordered an x ray examination, to rule out renal or ureteral calculus; I also asked that the routine laboratory tests be made. I then transferred the man to the surgical service.

The following morning Dr. M. T. Reynolds, of the surgical staff of the hospital, made a complete examination, and on introducing his finger into the patient's rectum—the patient in no way, even now, directing the surgeon's attention to this field—felt the hard edge of the foreign body, situated high up in the rectum. It proved to be a full sized drinking glass.

Under ether narcosis, the rectum was widely dilated, and the glass was removed, with difficulty, by traction. The mucous membrane about the lower end of the glass (i. e., the top, for the glass had been introduced inverted) was markedly edematous. The glass measured four inches high, two and three eighths inches across the bottom, and two and five eighths inches across the top. The lower (top) edge of the glass was chipped. We later learned that this was caused by the patient's frantic efforts to remove

it in the beginning, with a pair of pincers. Possibly filling the glass with plaster of Paris before attempting extraction might have made the task easier. Two lacerations which the patient received during the extraction of the glass were sutured. The patient made an uneventful surgical recovery.

Later, when first informed of what had been found, he had no voluntary explanations to make. He at no time expressed any gratitude to Dr. Reynolds; instead, was rather sullen. Needless to say the röntgenologist was somewhat perplexed at his own findings, for at the time he knew nothing about the surgical condition. The patient resented our attempts to get a complete history during his convalescence. He was at times mildly arrogant, inclined to argue, and said that he did not have to answer our questions. It was not until I threatened to send him to a psychopathic ward that he became more communicative. He came from a comfortable home but I never could get his mother to visit us. This seemed doubly strange, in view of the fact, which I learned after he had left the hospital, that he spoke once to his mother about using a glass. She thought that it was just a queer idea of his.

We had to build up his history with facts as we could get them; neither the patient nor his family gave us any help. We knew that Dr. Glynn had been first called to see him two and a half days before the operation; that he then told the physician he had been in bed for two days in great pain. At the time of the operation he said that his bowels had not moved for five days. Later he told me that he introduced the glass five days before the operation. He admitted it was done for its erotic effect.

His diffidence and failure to cooperate made it difficult to form a complete psychometric or psychiatric estimation of his personality. He was with us only two weeks. He showed no intellectual defect and I did not feel that I could call him a moron. He was in the 8B grade when he left school at the age of fifteen. A painter by occupation, he followed this calling rather spasmodically. His family, with whom he lived, supported him when he was not working. He was hypochondriacal, and at varying periods during the past few years he would say he was too weak to work; or that he had a twisted back; or that he was lame; but neither doctors nor clinics could find any organic condition. He evidently capitalized his hypochondriacal trends to evade his obligations. He looked strong, was about five feet seven inches tall, and weighed 145 pounds. The general physical examination of him was negative. It might be said here that he was not regarded as queer by his neighbors.

He was of the seclusive type, rather inattentive, introverted, selfish, lazy, and evidently had few friends. He had avoided the opposite sex all his life, even in a social way. He denied masturbation, as ordinarily practised. He spoke to a few patients in the ward; most of the time he was quiet and rather submissive. He showed no other psychotic phenomena while under our care. I did not feel that he should be classed in the dementia præcox reaction type at this time. I inclined to the belief that he was a constitutional psychopath, of the inadequate and sexual type.

He was very resentful for having been drafted into the Army. I wrote to the War Department about him but the only information they had was that he had received an honorable discharge at Camp Upton two months after his induction into the Army. This was at the time of the Armistice. He illogically blamed the Army for the persistence of his symptoms. He used good language in answering our questions. In answer to my question asking him if he was not abnormal, and not fit to take care of himself, he said rather petulantly—"Certainly, I consider myself normal."

This case is remarkable when one considers that for four and one half days this man had a dangerous foreign body in the rectum; that it caused intense pain, necessitating the giving of morphine; that though he begged for the relief of pain, nevertheless he allowed five physicians to examine him and purposely hid the facts, even going to the operating room, stubbornly keeping his story to himself. He said to me later: "I didn't tell what was wrong, because I knew you would find out some time, anyway." . . . "No, I suffered too much, to think about shame." And he was still waiting on the fifth day. During convalescence he showed little real shame; nor was there any real mental tension.

He evidently had no conflicts whatever concerning this method of gratifying his feelings. After repeated questioning, he admitted active rectal auto-eroticism extending over a period of ten years, i. e., since his fourteenth year. Twice as a boy he permitted rectal coitus. Then for a long time he introduced ordinary candles into this organ. Next he employed medicine bottles of gradually increasing size. After a number of years' practice with the foregoing articles, he felt qualified to try the *pièce de resistance*—a drinking glass. This brought him to the hospital. I could not get him to state whether he had an orgasm or not, at the time of this accident; however, I believe that he did have one.

This aberrant type of rectal stimulation is not as rare as some physicians think it is. The use of the particular object used by this patient is rare, of course. In those cases, the supremacy or primacy of the genital zone as the source of pleasurable stimuli is transferred or displaced to the anus and the rectum. It is important to remember that patients afflicted with such anomalies of the sexual impulse rarely spontaneously complain of them to the physician, even in the minor cases. This case was very unusual, in that here we had a man who hid the facts for nearly five days, and might have suffered a fatal ulceration of the gut because of his secrecy.

The mere fact that these cases are esthetically displeasing must not prevent the physician from becoming acquainted with, and recognizing the pathological use made of this part of the body by psychopaths. The literature, especially that part covering the neuropsychiatric and genitourinary fields, contains numerous references to these cases.

It is a well known physiological law, which Ernest Jones has so often referred to, that body orifices, where skin and mucous membrane meet, are very sensitive and under certain conditions may become erogenous zones. Routh, Dessoir and others

have called attention to the erogenous irritability of the anus and rectum. Garnier, Iwan Bloch, Hammond, von Krafft-Ebing, Taxil, Ellis, von Schrenck-Notzing, von Maschka, also the gynecologist Kisch, Müller the ethnologist, Weeks the anthropologist, and numerous other writers cite cases dealing with these abnormal conditions.

While not intending to enter into a discussion of all the physical and psychic factors causing these anomalies, I would merely like to refer to a few explanations given by modern writers. Practically all authorities agree that these anomalies have their origin in childhood. The habitual and often unnecessary administration of enemas to young children is warned against, as is also the unlimited, innocent patting of the skin of this region, done for its soothing effect and to induce quiet and sleep in children. Kempf has shown in his book on *Psychopathology*, how these pleasurable stimuli in the child, particularly the neurotic child, condition the feelings and reactions in adult life.

William A. White, of Washington, who has written masterfully on this subject, calls attention to the fact that children often take an undue interest and pleasure in the excretory acts. This pleasure may become so intense and fixed as to interfere later in the biological supremacy of the genital sensory zone. One can then readily understand how the anal and rectal zones—becoming of the greatest sensory importance to the individual—open up a field for the development of perversities and perversions. I might note that in this patient neither ordinary inasurbation nor coitus were ever indulged in. Moll, a profound student of child psychology, refers repeatedly to the abnormal activities of children in this direction. A patient of mine, a refined young

woman, is too conscientious to stimulate the genitals directly; her autoeroticism is consummated by means of the enema. Montegazza, in showing that rectal sensory stimuli may be pathologically pleasant, mentions a writer whom he knew, in whom defecation was more pleasant than coitus.

Pronounced psychopaths of this class are said by some writers to have certain characteristic traits; e. g., they are said to be sullen, morose, slovenly and miserly, hoarders of trash; they are often cruel, and hate with great intensity. If they recognize these traits, they may compensate in the opposite direction. This is merely in keeping with a well known psychological law, that the most natural association of a word or an idea is its opposite—e. g., we first think of short, when we hear tall; good, when we hear bad; white, when we hear black, and so on. The hebephrenic form of dementia præcox in the anal erotic types, if they become psychotic, is very likely to develop. Two of the chief characteristics of this form of dementia præcox are destructiveness and wastefulness.

In concluding, I would like to reiterate that rectal anomalies of the sexual impulse are not rare; that patients rarely complain spontaneously of the minor ones to the physician, even though they are causing symptoms. It is a *sine qua non* that these patients must be recognized, before they can be managed. That they are unpleasant is uncontroversial, but one should remember the words of Tardieu: "No physical or moral misery, no suffering, however corrupt it may be, should frighten him who has devoted himself to a knowledge of man and the sacred ministry of medicine; in that he is obliged to see all things, let him be permitted to say all things."

92 GATES AVENUE.

Traumatic Injuries of the Abdomen

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Traumatic injuries of the abdomen are often so serious and at times so insidious, that the skill and prompt decision of the surgeon is taxed to the utmost. They are serious because important structures have been injured or entirely destroyed. They are insidious because during the first few hours following some accidents the symptoms may be mild, and I am sure we all have seen abdominal injuries immediately following an accident in which the symptoms were almost entirely lacking. In order to prevent serious hemorrhage or spreading peritonitis in those cases an early and correct diagnosis must be made. Late diagnosis and late operation may spell disaster.

In considering injuries within the peritoneal and abdominal cavities and considering the causative force producing those injuries, you immediately conclude that there are two types of missiles producing them, first, penetrating missiles, such as a

bullet, piece of steel, knife, or some pointed object, and second, those that are blunt and not penetrating. The injuries produced by the first type of missiles are usually penetrating wounds, while those from the second are usually a blow from a piece of gas pipe, a kick from a horse or a person, a fall from a distance on the abdomen, or pressure over the abdomen between two objects, such as a squeeze between two cars. It is quite evident that penetrating wounds will be more often met and will more often be serious, but this does not mean but that just as serious wounds cannot be produced by blunt objects. I am sure all have seen ruptures of the bowel and injuries to the viscera produced by the kick of a horse or a fall from a distance.

In injuries to the abdominal contents pain is usually one of the first and most constant symptoms, its character depending upon the amount of fluid, whether blood or intestinal contents, escaping

into the peritoneal cavity. Associated with pain there will be spasm of the abdominal muscles, especially the recti. Spasm may be slight, especially during the early stages, but if care is taken it usually can be detected. Following these we find accelerated pulse, increasing temperature, leucocytosis and, if excessive hemorrhage is present, we will find the blood picture of hemorrhage. To this may be added clammy skin and an anxious expression. Vomiting may or may not be present but is usually present when blunt objects have produced the injury. In stab wounds of the belly it is not unusual to find a piece of omentum or bowel protruding through the wound. In kidney lesions we find distress in the lumbar region and, on palpation, a tender tumor over the kidney together with blood in the urine. In bullet wounds the x ray is of value in determining the direction and location of the bullet.

The point of entrance may be a guide to the structures injured. In injuries to the lower thorax or upper abdomen the following structures may be involved: stomach, spleen, liver, pancreas, transverse colon, and kidney. In midabdomen the small bowel is most frequently injured. To this may be added the large bowel, mesentery, and omentum. In the lower abdomen we find the large and small bowel, rectum and bladder. Not infrequently we find a fracture of the pubic bones, associated with which may be a ruptured urethra. In the lumbar region the kidneys and large bowel are most frequently injured. One of my patients was shot through the upper right thigh posteriorly with the bullet entering the right pelvis, the only abdominal injury produced being a contusion of the head of the cecum. The bullet was removed from the pelvis. Another patient was shot in the left lower abdomen and died suddenly. At autopsy the bullet was found to have entered the abdominal cavity and severed the right iliac artery near the junction of the femoral. There was no other abdominal injury except contusion of the bowel.

There are patients brought to the hospital in whom we are called upon to differentiate between shock and active hemorrhage. Patients operated upon while in shock nearly always die. In cases of active hemorrhage the patients will die if not operated upon, so it is necessary to make a prompt and definite decision between these conditions. The mistake usually made is that active hemorrhage is treated as shock and valuable time lost. However, the distinction is not an easy one. The symptoms of rapid pulse, anxious expression, clammy skin, low blood pressure and subnormal temperature are the same in both instances, but the history of the case, together with examination of the blood, will help us in the diagnosis. If the history suggests possible injury to a large artery we should be suspicious of hemorrhage and in an examination of the blood in hemorrhage we will find an increased leucocytosis. In shock the blood shows very little change. It is scarcely necessary to say that in cases of active hemorrhage operation should be performed promptly and in cases of shock the patients should not be operated upon until they have responded to stimulation.

If the lesion is intraperitoneal the median incision of good size should always be used, as all intra-

peritoneal lesions can be best reached by this incision. The wound produced by the missile is closed from within by a running suture of catgut in the peritoneum. It seems unnecessary to add that these operations must be done thoroughly and as quickly as possible. When the abdomen is opened we first find blood, and if gas is noticed we know that there is a lesion of the intestinal canal. In injuries of this type the whole intestinal canal must be examined and each hole in the bowel closed as it is reached. All exposed bowel must be kept warm by hot towels or packs. Occasionally we find a piece of small bowel so badly injured that resection is necessary. If the anterior wall of the stomach is perforated the posterior wall will usually be perforated also. When this condition is present the gastrocolic omentum is opened and the lesion found and repaired, the rent in the omentum being repaired immediately afterward. It is unusual to find sufficient soiling of the lesser peritoneal cavity to require its drainage. However, when there is demonstrable soiling of the peritoneum, whether in the lesser or greater cavity, it should be removed by mopping with moist gauze. We do not irrigate as we are convinced that this procedure only spreads infection.

If the liver is injured and bleeding, the bleeding can be controlled by grasping the hepatic vessels through the foramen of Winslow. Deep sutures should be placed in the liver and tied gently. If the hemorrhage is not too serious the actual cautery may be used or, in cases of severe hemorrhage, the placing of a piece of omentum in the wound before the stitches are tied has been most successful in controlling such hemorrhage. If the spleen is injured a splenectomy, partial or complete, may be done and if the injury is not too serious, the spleen may be sutured. Another method followed by Senn is to crush the splenic structure slowly with broad pressure forceps, then suturing the crushed margins with catgut. In injuries to the pancreas an attempt should be made to suture the pancreatic structure. This, however, is a difficult and serious lesion. Packing may be all that can be done. If the bladder is injured intraperitoneally, interrupted and Lembert sutures are placed, a catheter inserted in the bladder through the urethra and left for forty-eight hours, and urotropin given by mouth. If the bladder is ruptured in the space of Retzius the lower abdomen should be opened to this space and the bladder sutured, after which the abdominal wound should be drained and a catheter placed in the bladder. If the membranous urethra is ruptured the perineum should be opened and the bladder drained.

When blood is found in the urine after an accident it is usually evidence of the fact that the kidney has been injured. However, we have found bloody urine in patients who received a blow in the lumbar region and who recovered in a few days after simple rest in bed. Those cases undoubtedly are due to contusion without laceration of the capsule. In cases in which the capsule has been ruptured and where the urine has escaped perirennally, operation offers the only hope of cure. If the rent in the capsule is slight it may be sutured but if much destruction has taken place, it will be necessary to remove the kidney. In all those cases in which we have endeavored to repair extensive in-

juries of the kidney, we have had to remove the organ later because of the infection which has taken place.

Drainage in all these cases is of importance and, if there is soiling of the peritoneum, the wound should always be drained. When the incision is in the lower abdomen the drain can be readily placed in the pelvis. When the incision is in the upper abdomen and much soiling of the peritoneum has occurred, one small drain may be placed in the wound itself and another drain instituted through a stab wound in the lower belly so as to drain the pelvis. All drainage should be removed at the end of thirty-six or forty-eight hours. The wounds in severe cases should be closed with through and through sutures of silkworm gut, as closure can be done more rapidly in this manner. The patient should be placed in the Fowler position and proc-

tolysis immediately instituted. Morphine and atropine are prescribed as required. The necessity of other stimulation is questionable and we are convinced that any patient requiring further stimulation than morphine and atropine usually dies. If undue vomiting occurs the stomach is washed out. No attempt to move the bowels should be made until the end of three or four days.

CONCLUSIONS.

1. Some abdominal injuries are serious but lacking in symptoms during the first few hours following the injury.
2. Pain and muscle spasms are the first and most constant symptoms.
3. Patients are lost when the distinction between shock and hemorrhage is not promptly made.
4. Soiling of the peritoneum should be removed by moist sponges.
5. Median incision should always be used.

470 FRANKLIN STREET.

The Abdominal Contraction Method of Diagnosis

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Physical examination of the abdomen does not as a rule reveal as satisfactory evidence concerning the true nature of conditions within the abdomen as is obtained from a physical examination of the chest and the rest of the body for information relating to the status of these respective parts. However, in spite of the inadequacy of this means of abdominal study, we feel inclined to make use of it. We may from time to time obtain interesting data from a physical study of the abdomen and since such a study entails little, if any, discomfort to the patient, its use appears justified.

Different methods have been employed in the examination of the abdomen, based principally upon the appreciation of variations in percussion or auscultatory sounds, in palpatory sense, or in a combination of both. Practically all methods of physical examination of the abdomen incorporate these principles to a certain degree. Through the methods in vogue we make a study of abdominal tenderness, differences in muscle tension, changes in general abdominal tension, variations in abdominal tympany or flatness, and so on, and from the results of our findings we endeavor to ascertain the causes.

Of all the methods employed, I have heard no stress placed upon a method embracing the principle of maintained voluntary abdominal contraction. I have used this method as a routine in a great number of cases and as a result feel that I have derived information that other methods had not afforded quite so distinctly. That it is far from perfect goes without question. That the x ray and other studies give more definite information is not doubted, yet, for a simple method, easily induced with no discomfort to the patient, and productive of information that is often of value, this method, in my opinion, deserves mention.

The method is based upon the principle of increased intraabdominal tension and the pressure is

exerted in a downward direction. It may be called the abdominal contraction method of diagnosis. It consists simply in having the patient institute the bearing down act of defecation after having first taken a deep inspiration. The patient is instructed, while in a recumbent position, to take a deep breath and then bear down upon the abdomen while holding the breath. As a result, the diaphragm is prevented from moving upward by the closure of the glottis and the abdominal muscles are contracted down while the muscles of the perineum are relaxed, in consequence of which the visceral organs of the abdomen and pelvis are forced downward. It seems to me that during this act the stomach and bowels assume a more anterior as well as lower position in the abdomen and are, therefore, more accessible for study. Inspection, percussion, auscultation, deep pressure, and other palpatory methods may be practised while the abdomen is thus contracted.

This method, however, will not promise clarification in every case. I have noticed that in some cases it serves much better than in others, probably because in certain instances the abdominal muscles are not so stout nor so highly developed or because the particular degree of muscle tension favorably adapts itself to our means of study. It also has its disadvantages as well as its advantages. It should not be used as a substitute for any other method but rather as a supplement. Heretofore it has been our main object, while examining a patient, to gain as complete relaxation of the abdomen as possible and to overcome every possible chance of contraction so that the organs may be palpated through the soft abdominal wall. This method, on the contrary, is supported through the medium of abdominal contraction. It may be contended by some that this bearing down method gives us a false idea of the position of the organs, in other words, a dislocated picture, but I feel that in those cases where an organ

shows itself in an unduly low position, there is a definite anatomical or pathological reason for it. It has also occurred to me that the methods of percussopalpation and percussoauscultation, so often practised in our study of the abdomen without fruitful results, may make a more favorable impression when resorted to under the conditions of abdominal contraction. It seems that the contracted muscles with the associated downward pressure so modify the sounds that ordinarily emanate from a lax abdomen as to enable us to differentiate more clearly the tones from the different organs, either by hearing or through the sensation imparted to the finger tips. Often, when inspecting an abdomen, little information of value is obtained, but when this same abdomen is examined during the period of contraction, additional points of interest may be noted. The outline of the stomach and bowels are often seen in the abdominal surface and the condition of the abdominal wall is often much better appreciated. Therefore, from the viewpoint of inspection, percussion, and auscultation, this method has a place. I might also add that in examinations of the vagina for cystocele and rectocele, for other examinations by the vaginal route, and for inspection of the anus, this method will serve its end.

The process of contraction and its unopposing perineal relaxation will serve to demonstrate weaknesses in the abdominal wall, such as ventral and inguinal hernias, diastasis recti, general abdominal loss of tone, and similar conditions. Visceroptosis will appear more clearly defined in many patients, especially fat people, who do not ordinarily clearly show this condition. Very often by taking a side glance at the abdomen, the surface contour will define clearly the position and limit of the ptotic or atonic stomach underneath. Profound ptosis and gastric dilatation show their impression very clearly and abdominal asymmetry due to tumors will often demonstrate itself plainly. In spite of the contracted abdominal muscles, palpation may reveal a ptotic kidney or liver that was impossible of palpation

through other means, such as forced inspiration or expiration. Peculiar as it may seem there are times when certain masses are more clearly felt by the use of this method. Percussion over the contracted abdomen will often enable us to outline the stomach more distinctly and to differentiate stomach from colon tympany more clearly. It seems that the stomach is wafted forward, as a result of which a fairly good idea is obtained regarding its size, position, form and mobility. Abdominovaginal or abdominorectal palpation during the application of this method will also facilitate the examination of the fallopian tubes, ovaries, and uterus.

I have also noticed that in acute diseases of the abdomen, where muscle rigidity overlying the diseased organ has already established itself, this super-added contraction effort seems to aggravate the existent tenderness or pain. I have also observed that in most cases where patients complained of subjective abdominal pain, independent of palpation or deep pressure, this voluntary contraction had a tendency to augment it, whereas, in those instances where pain or tenderness was experienced only upon palpation, additional muscle contraction did not seem to influence it, except in a favorable way. Muscle hyperalgesia, which supposedly bespeaks disease or disturbance in a visceral organ that segmentally corresponds to the nerve distribution in the muscle, may also become better understood through a more thorough and consistent study of this subject. Therefore, let us more closely investigate conditions of voluntary muscle contraction and voluntary relaxation, as well as conditions of involuntary muscle contraction and involuntary relaxation, their relations to one another, and their effects upon muscle sensitiveness.

In conclusion, I would say that, although there is nothing new about abdominal contraction, there does seem to be something new about its use in abdominal study, and for that reason I have given consideration to it.

768 WEST END AVENUE.

Certain Infectious Diseases Which Are Interesting the Medical Profession at the Present Time*

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The title of this paper is a rather elastic one, but I am going to use it as a text on which to base a practical discussion of three diseases which are more or less in the public eye just now, namely, typhus fever, encephalitis lethargica, and smallpox. I will confine myself principally to their clinical pictures, as they have appeared to me in the course of my diagnostic work in the Bureau of Preventable Diseases, Department of Health.

TYPHUS FEVER.

The incubation period of this disease is twelve to fourteen days. If, as seems proper, typhus fever

is considered an eruptive disease, the entire period of onset should be looked upon as a prodromal stage. The outstanding features of the clinical history can be summed up under four heads, as follows:

1. The onset is abrupt, with chill, nausea, vomiting, high fever, backache, and a headache which is very severe and which persists unabated through the greater part of the attack.
2. The temperature rises sharply, reaching its highest mark early in the disease, and, having attained this mark, the fever chart will resemble somewhat the fastigium stage of typhoid fever until approxi-

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mately the eleventh day. The evening temperature will be 104° F. in an ordinary case and 106° F. or 107° F. in a severe one, with a morning remission of a degree and a half to two degrees. On the eleventh day there begins a steplike drop which brings the temperature to normal usually on the fourteenth day, the patient showing marked improvement with this defervescence. Rarely in place of the abbreviated lysis there is a distinct crisis, and again the fever may last only twelve days, or it may run over to sixteen days, but the steplike drop terminating the fourteen day fever course is most characteristic.

3. The rash which appears from the third to the fifth day is a most important addition to the picture, for without it, in the present state of our knowledge, it is impossible to make a definite diagnosis. It generally shows first on the abdomen, and spreads over the trunk and extremities. It exhibits a tendency to avoid the face and less and less disposition to develop as it approaches the distal ends of the extremities. It may be profuse on the trunk, and the entire skin between the lesions may appear congested. There are two distinct features to this exanthem. First there appear small red macules of irregular outline which vary in size from a pinhead to a split pea. These lesions are subcuticular, rather indistinct, fade readily on pressure, and, when present in numbers, give a decidedly mottled appearance to the body. About forty-eight hours after the appearance of the macules one may distinguish with a magnifying glass, or perhaps with the naked eye, little petechiæ forming on some but not all of these lesions, and not infrequently these petechiæ may simulate delicate red striæ running from the centre to the periphery of the macule. The petechiæ are caused by stasis in the capillaries running through the lesions, and soon the blood extravasates through the vessel walls, coalesces into a homogeneous layer, and gives a purpuric spot which will not fade on pressure. The spots will remain after the return of the temperature to normal, and with age they acquire a brown or greenish brown hue. In a case recently seen on the fourteenth day the trunk, groin, axillæ and flexures of the elbow were literally peppered with these small spots. It is asserted that they are somewhat raised above the surface, but the elevation must be very slight.

4. The other distinctive point about this disease is the peculiar facies. The patient looks stupid and apathetic (or, if delirious, he has a wild, staring expression); the eyes are heavy, the pupils are contracted, and the conjunctival blood vessels intensely injected; the face is swollen and is covered by a dark red flush, which at times is so marked as to give the impression of a confluent rash.

Keeping these four main features in mind, we may in addition count on some or all of the following symptoms and signs. Prostration which is progressive; constipation; the pulse is rapid and, in contrast to that of typhoid fever, generally in keeping with the temperature; the mucous membranes are congested; the tongue is brown and furred; there is a cough with or without definite pulmonary signs; delirium ranging from the low form to the maniacal; subsultus tendinum and carphologia; tinnitus aurium

with deafness developing late in the attack; there is likely to be nosebleed, repeated and perhaps uncontrollable; the spleen is only moderately enlarged, and there is always a leucocytosis, the white cell count varying from 10,000 in mild to 30,000 or more in severe cases.

Now as you know we seldom have an opportunity in New York to study epidemic typhus fever, although in the limited number of cases I have been privileged to inspect I have been fortunate enough to see some very typical attacks. We do have each year a considerable number of cases of endemic typhus, or Brill's disease which, in its clinical picture, bears a striking resemblance to epidemic typhus. The fever curve in each instance is similar, though the temperature is not so high, perhaps, in the endemic form. In this disease, too, the rash looks like that of real typhus in many respects, but it neither develops so profusely nor does it show much tendency to become purpuric. Moreover, in endemic typhus the nervous symptoms are not so pronounced, the white cell count is lower, rarely over 15,000, and the facial appearance is not distinctive. The patient does look dull; he complains much of headache if asked about it, and in general is a sick looking individual. There are three particulars in which these two varieties of typhus, if I may so call them, differ materially: 1. Endemic typhus occurs mostly in the summer and fall, real typhus principally in the winter. 2. The victims of the milder affection apparently do not die. 3. Secondary cases rarely develop. If the etiology and mode of transmission of these two forms of the disease is the same, as claimed by some good authorities, this last point certainly leaves something for the louse to explain.

A laboratory aid to diagnosis which is used by the health department in doubtful cases is the Weil-Felix reaction. This is similar to the Widal, save that it is not a specific test, the agglutination taking place in the presence of the *Bacillus proteus* X₁₉. It is said that this organism can be regularly recovered from the urine of the typhus patient. Agglutination may occur early; it should respond in a one to twenty-five dilution by the sixth day, but is of real value in the second week when clumping will occur in one to two hundred or higher dilutions.

Typhus fever must at times be differentiated from malaria, meningitis, smallpox, pneumonia and other acute infections, but the diseases which we would be called upon in all likelihood to exclude in this locality are typhoid fever and measles. The former has a less violent onset, longer course, slower pulse, greater enlargement of the spleen, a rash of a decidedly different character, absence of leucocytosis, a longer stage of defervescence, and a positive Widal.

Every now and then someone mistakes measles for typhus fever, and the diagnostic error is not inexcusable. You certainly can get the impression that typhus is measles from the appearance of the trunk; the deeply flushed face as has been intimated before may at times resemble a confluent rash, and the congested conjunctiva adds to the perplexities of the case. In measles, however, we have a distinct prodromal period characterized by catarrhal symptoms and cough, the rash when it appears is more

diffuse, it freely involves the extremities, the face and the region behind the ears, and we have Koplik spots before and during the appearing of the rash.

ENCEPHALITIS LETHARGICA.

This disease has but recently been made a reportable one by the Board of Health, and I am of the opinion that that fact is responsible for our hearing so much about it this winter, for it seems certain that there have been actually fewer cases so far this year than in the corresponding period last year. Encephalitis lethargica has probably more varied ways of manifesting itself than any other infectious disease, and as a result of its protean character there is no affection of the central nervous system which it may not at some time simulate. We still in all probability have much to learn about many of its phases. The group of symptoms and signs now to be mentioned will include all of those regularly met with and a good proportion of the rarer features of the clinical picture.

The onset is usually gradual, though it may be abrupt in children: there is very consistently headache, dizziness and diplopia; constipation is the rule, vomiting is not so common; there is somnolence almost always; some fever, irregular, rarely high, and possibly long continued; the pulse is increased in rate and regular; there is mental sluggishness and a notably belated response to questions; the features show a striking immobility and there may be insomnia, tremors, muscular twitchings, delirium and convulsions.

There is early and very constant evidence of ocular palsy, most often of parts supplied by the third cranial nerve, then of the fourth and sixth, and occasionally all three nerves are affected. As a result there will be ptosis, internal or external strabismus; the pupils may be unequal, slow to respond to light, and perhaps failing entirely to do so; there may be nystagmus and other disorders caused by the involvement of these nerves. One form of abnormality may affect one eye and a different form the other, as, for example, a ptosis on one side and a strabismus on the other. In addition to the nerves just mentioned, the motor fibres of the fifth, the seventh, ninth, eleventh and twelfth, more rarely the tenth, cranial nerves are attacked. The disease appears to confine its attention to the motor nerves.

The neck is often stiff, there is sometimes a Kernig, the knee jerks are regularly increased at first but may return to normal as the disease progresses. The somnolence will vary from a slight and even an intermittent drowsiness to a very deep sleep from which it is difficult to arouse the patient. There are attacks in which there is wild excitation instead of somnolence. While low grade temperature is the rule, I am told that it is not uncommon to find a case with no elevation of temperature at all.

Dr. Josephine B. Neal, of the Health Department Research Laboratory, to whom I am indebted for much valued information about this disease, states in a treatise on the subject (*Epidemic or Lethargic Encephalitis in Children*) that an officer in the Public Health Service told her that he had seen in the South many cases with a transient diplopia and strabismus without other symptoms, certainly a queer feature of a serious disease.

Spinal puncture produces a clear fluid, increased in amount and showing moderate increase in cells (of the small mononuclear lymphocyte variety), albumin and globulin with normal reduction of Fehling's.

The course of the disease has no set limits, and the patient may drag along for many weary days, weeks, and even months, with from time to time rapid changes for better or worse.

Encephalitis lethargica must in practically every instance be differentiated from one or more of the following diseases: brain tumor, syphilis of the brain or cord, uremia, meningismus, poliomyelitis and polioencephalitis, epidemic cerebrospinal meningitis and tuberculous meningitis. From the viewpoint of a Health Department diagnostician, it appears that acute anterior poliomyelitis and tuberculous meningitis are the most prone to cause trouble in diagnosis.

At the present time polioencephalitis and lethargic encephalitis cannot be differentiated. Nor is it possible to decide between poliomyelitis and lethargic encephalitis by the spinal fluid examination. The former disease, however, occurs more often in children, has a more abrupt onset, the temperature goes higher but is shortlived, the reflexes, though possibly exaggerated at first, soon decrease and then disappear, the patient is seldom delirious and the accompanying paralyses affect the trunk and extremities.

Tuberculous meningitis is difficult to exclude by the clinical picture. In adults, of course, there is usually an easily recognized focus of infection elsewhere, though in children it may occur as a primary trouble. The onset is generally more gradual than that of lethargic encephalitis, vomiting is more frequent, there is loss of weight, irregular pulse, early irritability followed by a stupor which increases to the point where it is impossible to arouse the patient, and the tendon reflexes disappear with the advance of the disease. The eye palsies in each disease may be similar.

In tuberculous meningitis the spinal fluid, though perhaps not always helpful early in the attack, will eventually solve the difficulty. As the disease progresses, the cells show notable increase in numbers and the sugar disappears. In encephalitis lethargica there is no great cell increase, and the Fehling's reduction remains normal.

SMALLPOX.

I am taking up this disease for consideration here not because it is occupying any noticeable place of interest in the mind of the profession, but because it ought to. Smallpox, in company with scarlet fever, has in recent years shown a marked tendency to become less severe than formerly. In the outbreak of 1900-1902 there were 3,631 cases recognized and 732 deaths, a mortality of twenty per cent. The stamping out of the disease at that time is a lasting testimonial to the efficiency of a widespread vaccination campaign, energetically followed up. From 1903 to 1920, inclusive, there were 567 cases, with forty deaths, a mortality record of eight and six tenths per cent., and, strange to relate, there has not been a death from smallpox in this city since 1912. When one traces out the peregrinations

of the visitor infected with this disease as he comes into our midst from Michigan, Oklahoma, South Carolina, and many other parts North, West and South, and who quite often is treated for several days by a most reputable physician, his trouble the while remaining unrecognized, one is forced to the conclusion that the same Providence which is reputed to watch over the drunken individual and children is working overtime in guarding New York from smallpox. The immediate, active and thorough steps employed by the health department upon the discovery of a case undoubtedly account to a great degree for our immunity, but even with these preventive measures always operating I fear that smallpox will not forever remain quiescent and that sooner or later a violent recrudescence of the disease will occur.

So, without undertaking any exhaustive review and without wandering far into the field of abnormalities, let me just refresh your minds with certain fundamental points which should be kept before us when attempting to diagnose smallpox or when differentiating it from its near relation, chickenpox.

Onset and stage of invasion: In smallpox it is as a rule sudden, with high temperature, prostration and severe general symptoms, most notable of which is the headache and lumbar backache, best described as excruciating. After approximately three stormy days, the temperature drops abruptly, though not necessarily, to normal; discomfort vanishes promptly, and, coincident with this subsidence of subjective symptoms, a rash appears on the face and wrists. Such a history, no matter how scanty the rash, means smallpox. True, the severity of the onset varies with different attacks, and in those who at some time have had a successful vaccination the stage of invasion may be greatly modified or even lacking. As a general thing, though, the prodromal illness is away out of proportion to the immediate subsequent developments.

Chickenpox in adults may be characterized by a violent onset, but it is shorter, a day or at most two days, in duration; and the discomfort and temperature overlap the appearance of the rash by a considerable time. In children, prodromal disturbance is negligible.

As just stated, the smallpox rash appears first and simultaneously on face and wrists; it then proceeds to occupy other portions of the body, and the lesions on the lower extremities may show up thirty-six to forty-eight hours after their first appearance on the face. But there is no disposition whatever to come out in crops, and all lesions in a picked locality will be of the same age.

The chickenpox rash shows first on the back as a rule, rarely on the face, and successive crops come out for the space of sixty to seventy-two hours. In contradistinction to smallpox, new lesions appear on parts previously invaded, and it is not uncommon to see representatives of three different crops alongside one another.

Dr. W. L. Somerset, chief diagnostician of the Health Department, aptly says that "the smallpox rash is centrifugal in its distribution; that of chickenpox is centripetal." The former invades most freely the exposed parts, the face, neck, wrists and hands.

There will be more lesions below than above the elbow; also more below than above the cuff line; there will be many more on the upper than on the lower extremities, and the palms and soles are attacked consistently. The rash is closest set on the face, next on the backs of the hands, and in comparison to either is sparse on the trunk. Another department phrasemaker with an observant eye for outstanding points says: "Give me the hands in smallpox, and you can have the rest of the body." One familiar with the disease will recognize the significance of his statement. There is, too, a noticeable tendency on the part of smallpox lesions to appear on the mucocutaneous border of the lips, to group themselves thickly around the mouth, and in light cases to avoid the hairy scalp.

Chickenpox rash is most profuse on the back, particularly the region of the scapulæ, though it may also freely involve the face; it always attacks the hairy scalp, absolutely avoids the mucocutaneous border of the lips, and I think is thickest set on the upper half of the face. The wrists and hands may be free from exanthem even where the trunk is invaded very thickly. On the other hand, it is not rare to find lesions on the palms and soles where there is a profuse rash elsewhere. In each disease the rash is equally distributed on both sides of the body.

Smallpox lesions pass through fairly definite stages to maturity without abortion, collapse or rupture; they are, on the whole, deep seated, have an indurated red areola, feel shotty, and they are practically uniform in size in each stage. The vesicle in its early development is small, pinkish in color, and may be umbilicated; as it progresses it attains the size of a split pea, is pearly white in color, opaque, and, owing to its multilocular structure, it will not collapse if punctured, nor can it be crushed under the finger. In the pustular stage the lesion reaches its greatest proportions; it appears overstuffed or ballooned up, it is gray or yellow in color, and it desiccates without rupture, forming the firm, thick scab which completes the cycle of the lesion.

The chickenpox lesion has no such impressive course as has that of smallpox. A few may run through macular, papular, vesicular, pustular stages and scab in a brief period, but many lesions abort, many more have their fluid contents absorbed, and many rupture early in the disease. The lesions show great variation in size. The chickenpox vesicle is superficial and may have a very wide non-indurated areola; it is translucent; it is monocular and easily crushed under the finger, wetting both the finger tip and the skin around the lesion. The scabs are most often formed by rupture of the lesions, and they are thin and friable.

The umbilicated vesicle deserves a special word, for it is pathognomonic of the disease. This feature is much talked of but seldom seen, for it occurs in the majority of cases before the doctor is called to the patient. It is not noted in every vesicle, but when present it gives the appearance of a tiny dent in the top of the developing vesicle. In addition to appearing early it also disappears very promptly. The apparent explanation of the umbilication is that

exudation and cell hypertrophy proceed more rapidly around the periphery of the lesion than in the centre, causing a peripheral bulging.

The chickenpox vesicle never shows a true umbilication. There does appear a retrograde stage, due to desiccation, which frequently bears a resemblance to the progressive umbilication of smallpox.

The other conditions which may simulate smallpox are too numerous for consideration in this paper. Syphilis and drug rashes may be mentioned as constituting at times disturbing elements in the field of differential diagnosis. In syphilis we may have a history of infection; the onset is not violent, there is no marked prostration, and the prodromal period

is prolonged and mild in comparison to smallpox. In syphilis also the lesions do not appear suddenly with cessation of general symptoms; there is a tendency for the rash to come out in crops, there is no umbilicated vesicle, and there is very seldom the regularly distributed rash which is so characteristic of smallpox.

As to drug rashes, we may learn that the patient has been taking a rash producing drug. In such conditions also we have no stage of invasion, the lesions often lack any appearance of inflammation, and in their general appearance, behavior and distribution there is always something irregular.

202 WEST EIGHTY-SIXTH STREET.

Crime and the Drug Habit

By JAMES A. HAMILTON, PH. D.,

New York,

Commissioner of Correction

Nine hundred and fourteen persons were received at the Workhouse, Blackwell's Island, during the year 1920 for drug treatment. They were committed in one of three ways:

1. Under section 249-A, known as selfcommitted, the person applies to the health department to be placed in an institution for treatment. The health commissioner commits addicts to the workhouse for treatment, and they are released only by direction of the medical authorities of the institution.

2. Under section 438, also known as selfcommitted, the person who is addicted applies to a judge of the Magistrates' Court and at his own request is committed to the workhouse hospital for treatment.

3. Under section 327 addicts can be committed by a judge, usually of the Court of Special Sessions. When they appear before the judge charged with some crime, he, finding them to be drug addicts, commits them to the workhouse for treatment, which terminates by direction of the medical authority. They are then returned to court and are dealt with on the original charge as the court sees fit.

Of the seven hundred and sixty-five men committed to the workhouse hospital for drug treatment, four hundred and thirteen, or fifty-four per cent., were old offenders; of the one hundred and forty-nine women committed, seventy-two, or forty-eight per cent., were old offenders. The eighteen men committed through the health department had previous records in one or more of our institutions.

The accompanying charts have been prepared by Mr. Gerh ard Kuhne, of the bureau of identification, and throw much light upon the extent and growth of drug addiction and its relation to crime.

Our records show that more than fifty per cent. of those addicted to the use of drugs have criminal histories. Some have had bad records prior to the use of drugs; but most have gone into criminal life as the result of the drugs.

That one may obtain a comprehensive idea of the

CHART I.

Showing the number of persons received at the Workhouse, Blackwell's Island, for drug treatment during the year 1920 and the number of previous sentences each had served in one of the correctional institutions for various offences.

	Men				Women				Grand Total
	\$327	\$438	\$249-A	Total	\$327	\$438	\$249-A	Total	
Number received...	438	309	18	765	91	58	..	149	914
First time.....	232	120	..	352	50	27	..	77	429
Identifications	206*	189*	18*	413*	41*	31*	..	72*	485*
2nd time.....	89	77	6	172	17	8	..	25	197
3rd time.....	56	50	6	112	7	7	..	14	126
4th time.....	26	24	1	51	3	3	..	6	57
5th time.....	20	16	3	39	4	3	..	7	46
6th time.....	5	6	2	13	3	3	..	6	19
7th time.....	7	10	..	17	1	1	..	2	19
8th time.....	3	2	..	5	1	2	..	3	8
9th time.....	..	1	..	1	1	1	..	2	3
10th time.....	..	2	..	2	..	..	..	1	3
11th time.....	..	1	..	1	2	1	..	3	4
12th time.....	..	..	..	..	1	..	..	1	1
13th time.....	..	..	..	..	1	..	..	1	1
15th time.....	..	..	..	..	1	..	..	1	1

206* 189* 18* 413* 41* 31* .. 72* 485*
 54 per cent. men are old offenders.
 48 per cent. women are old offenders

CHART II.

Showing the number of persons committed to the Workhouse, Blackwell's Island, for drug treatment under the various sections of the law, who had received previous treatment at the Workhouse and how many times.

	\$327	\$438	\$249-A	Total
2nd time	56	64	4	124
3rd time	11	12	1	24
4th time	1	4	1	6
5th time	1	1	..	2

CHART III.

Showing number of persons committed to the Workhouse, Blackwell's Island, for drug treatment each month during the year 1920, under Sections 438, 249-A and 327.

	Men				Women				Grand Total
	\$327	\$438	\$249-A	Total	\$327	\$438	\$249-A	Total	
January	61	..	3	64	12	..	..	12	76
February	40	3	6	49	11	..	..	11	60
March	32	21	3	56	6	3	..	9	65
April	23	6	1	30	10	..	..	10	40
May	36	16	..	52	9	2	..	11	63
June	58	15	1	74	5	..	..	5	79
July	43	25	1	69	11	2	..	13	82
August	28	39	..	67	7	6	..	13	80
September	26	50	..	76	1	12	..	13	89
October	36	56	..	92	3	11	..	14	106
November	38	29	2	69	9	12	..	21	90
December	17	49	1	67	7	10	..	17	84
	438	309	18	765	91	58	..	149	914

CHART IV.

Showing the number of persons committed to the Workhouse, Blackwell's Island for drug treatment under Sections 438, 249A and 327 during the year 1919, compared with the persons committed under the same sections of the law during the year 1920.

Year	Men				Women				Grand Total
	§327	§438	§249-A	Total	§327	§438	§249-A	Total	
1920	438	309	18	765	91	58	5	149	914
1919	365	..	133	518	61	..	..	66	584
	53	309	115*	247	30	58	5*	83	330

*Decrease

treatment of drug addiction it is necessary to note the effects of opium or its derivatives on the habitual user, and to bring out the salient features and the reasons for different methods of treatment as outlined by the several observers who have made extensive and original attempts at a cure.

EFFECTS OF OPIUM.

The principal action of opium is exerted on the nervous system. All three divisions are involved, the sympathetic system, the cerebral centres, and the gray matter of the spinal cord. As a result there are mental depression, a slowing of the respiration, and the cardiovascular and other centres are depressed. Exaggerated reflexes are common. Metabolism is affected, the secretions diminished, and the biliary and glycogenic function of the liver impaired. The disturbed vasomotor centres cause a contraction of the peripheral circulation with a dilatation of the splanchnic, producing a rise of blood pressure and a cold, pale skin. All secretions are diminished, with the exception of the sweat.

The patient presents a picture of a poorly developed, poorly nourished individual, with a cold, clammy, wet skin, who is apathetic, does not care to move about, and is particularly loathe to bathe. If he is careful in the amount of the drug taken, he is able to attend to his daily task, does not suffer, but is continually losing ground. His power of resistance is lowered and he becomes an easy prey to current affections, tuberculosis, pneumonia, influenza, or any of the maladies we have to combat in every day life. If the opium is suddenly withdrawn there is a set of symptoms which are fairly constant and have been termed withdrawal signs. This condition is generally ushered in by yawning, sneezing, tremors, vomiting, and sometimes symptoms of collapse.

TREATMENT.

There are two plans of treatment that have been generally accepted as serious efforts for the establishment of a cure. The first of these abruptly withdraws the opium and substitutes some other drug. The second plan gradually withdraws the opium and meets the symptoms when they appear. The first plan may be further divided into a, the use of belladonna or hyoscine, and, b, an original method developed by Stokes.

Lott and Bishop are the exponents of the use of hyoscine. Bishop has advanced the theory that the body in an effort to combat overdoses of opium, develops or produces an antibody which is really responsible for the withdrawal signs.

Inhibition of function, which is one of the effects of the use of opium, locks some of the excess opium

in the cells in the organism, notably in the liver, where it is stored up and given off in the circulation from time to time as inhibition declines and the organs resume their normal functions. This stored up opium enters the circulation sometimes as late as a month or more after the withdrawal of the drug and produces new antibodies which in turn give rise to withdrawal signs. This accounts for the patient having recourse to the use of opium again. Bishop's treatment, based on this hypothesis, calls for a careful preliminary treatment to bring about, as near as possible, the normal functions. He recommends giving the patients sufficient opium for their bodily needs, and by cholagogue catharsis eliminating the excess of stored up opium and stopping autointoxication. When such a condition has been obtained the drug is withdrawn abruptly and sensation deadened with hyoscine. The patients are kept under the influence of this drug for several days, then hyoscine is stopped and rehabilitation started.

The Stokes method of treatment is based on the hypothesis that the sympathetic nervous system plays the important rôle; which is strikingly evident by the effect produced on the preganglionic nerve fibres going to the adrenals, a sharp output of adrenin being the result. Inhibition, especially of the vagus, is also accountable. Stokes asserts that he has found in eserine and pilocarpine a physiological antidote, and with these drugs he stimulates secretion and diaphoresis; the flow of saliva is increased; the tone of all involuntary muscle fibres is improved, and it is not necessary to give a laxative on account of the increased peristalsis and intestinal secretion. It slows the heart by stimulating the peripheral termination of the vagus.

According to the second plan, which is based on the assumption that opium is merely a toxic agent, the drug is gradually withdrawn, and at times the general economy is assisted in readjusting itself by the judicious use of a few medicaments to meet the symptoms when they appear. The term "when they appear" has been used for the reason that often there are no symptoms attached to the withdrawal of the drug. A great many drug users, especially those of the better type, use no more opium than is sufficient to keep them in perfect balance. These are not true drug addicts, but merely habitues, and the withdrawal of the drug is a very simple matter, entailing no more suffering than obtains with the breaking of any other habit, for instance, tobacco or alcohol.

After carefully considering them, plans a and b seem to be very plausible, each in its own way. Theories have been advanced which are reasonable, and they have many adherents who are excellent observers. The objection to them is in the use of dangerous drugs and the liabilities in inexperienced hands are enormous; so that the "cure" can never become universal owing to the scarcity of especially trained physicians and attendants.

There are just as many excellent clinicians who use the withdrawal plan of treatment as there are those who use the other two methods. The particular features that recommend the gradual withdrawal method are its absolute safety and its inex-

pensiveness. The real test, or proof, of the efficiency of any treatment is the result obtained. No one plan shows better results than another. They all come to a happy termination, the patient rapidly regaining weight and quickly reestablishing the normal functioning of the organs. The general improvement is so marked as to be a source of wonder even to the laity.

The method that has been selected for the Department of Correction was developed only after careful study and investigation of all methods used. The dangers of the other two methods were considered, as was also the expense, and finally a canvas was made of the drug addicts themselves as to the method they would prefer. Ninety-nine per cent. selected the gradual withdrawal system. The great majority showed a reluctance to accept the hyoscine method, because they were afraid of any possible complications that might arise from the use of this very potent drug.

The treatment given under the supervision of Dr. John M. O'Connor, briefly outlined, is as follows: When the patient is received he is immediately sent to the reception or clearing house hospital where he is given a thorough physical examination, note being made of any complications or other disease conditions which may need urgent or coincident treatment. If he is suffering from any infectious or contagious disease, he is retained at the reception hospital on Blackwell's Island and the drug cure is given there in conjunction with the treatment of his other ailments.

If the case is one of a combination of tuberculosis and drug addiction, it is first determined whether or not the patient's condition will permit the withdrawing of the drug. If it is not feasible to withdraw the drug, on account of aggravating his tuberculous condition, he is transferred to the tuberculosis hospital on Hart Island; or, if it is a court case, a report is sent to the commissioner with the suggestion that the patient be returned to court and the judge notified that it would be inadvisable to withdraw the drug at that time. In an uncomplicated case the patient goes immediately to Riker Island, where he starts on the cure. Here they determine his bodily needs; i. e., he is given sufficient opium to keep him out of pain. This is a variable amount, but as a rule fifteen drops of Magendi's solution administered three or four times a day is sufficient. The dose is prescribed at or near mealtime as an inducement for him to take some nourishment. If necessary a laxative is given. The opium is gradually withdrawn, one drop each day, so that at the end of two weeks they are completely off the opium and are then given strychnine or some supportive measure. The insomnia is taken care of by sedatives, preferably hyoscyamus, and the patients are taken out of doors as quickly as possible. The best somnifacient is not drugs, but fresh air and exercise. A body physically tired will sleep. The use of drugs and sedatives is to be curtailed as much as possible. The gastric secretions are just beginning to develop, and the stomach muscles, long disused, are awakening from a state of atony, and great care must now be exercised to keep anything of an irritating nature away from this organ, as it is

here that we build our hope on the future rehabilitation.

The nourishing of these drug addicts is really the most vital part of any treatment. Sufficient nourishment of an easily digested nature must be given, and that in amount which will not prove irritating to the delicate mucous membrane then in a state of metamorphosis. Physiologists have agreed that the number of calories needed to sustain a normal man at rest is in the neighborhood of 2,400. Estimates made of the dietary at the correction hospital have shown addicts to be receiving at least 4,000. This is considerably more than sufficient. It is true that too much reliance cannot be placed on these laboratory deductions, and we must, necessarily, corroborate these findings with the practical results. Over a thousand drug addicts have passed through the treatment in this department, and the average gain in weight is somewhere between thirty-five and forty pounds. This speaks very well for the treatment and the nutritive value of the food. Research work, particularly along the lines of the food given, is being conducted. The incidence of gastric disorder, hyperchlorhydria, gastric ulcer, hepatitis and cholelithiasis is so high that steps have been taken to determine if we are not feeding too much.

The opportunities for observation and study are better in this institution than at any other place. The court rules that they shall remain in custody at least one hundred days. Certainly, if complications are to arise, they will make their appearance within that time. We have never found a single patient who has taken the cure, as prescribed by the physician, who has ever felt a physical craving for the drug. When they have been taken off the drug and kept off at least one hundred days the doctor is through. The question then becomes a sociological one. There is nothing in any cure that will produce a later antagonism to the taking of opium, and by a cure we simply mean to relieve the patients in the safest and most humane way of the physical torture attending the withdrawal of the drug.

Dr. Stuart MacVean, resident physician at Riker Island, can point with just pride to a thousand or more drug cases, in which the patients have passed through the cure with no untoward symptoms in any case—a record that is not surpassed in any particular by any of the expensive institutions. He has been responsible for the treatment, the care, and the condition of the patients for a period of time that is considerably longer than at any other drug hospital. Complications would surely arise within a hundred days where they might not in three weeks, so that his results, while as good as any, have borne scrutiny for a longer period of time.

Dr. MacVean's good work has gone on without any flare of trumpets, without any advertisement, and without the hope of personal aggrandizement. Society in general, and particularly the commonwealth of New York, owe Dr. MacVean a debt of gratitude for his untiring labors, for his zeal, and for his rare judgment and tact in dealing with a class of patients that would make a man of less sterling qualities abandon the situation as being altogether hopeless.

MUNICIPAL BUILDING.

Editorial Articles

ENTERORRHAGIA IN HERNIA.

This complication arising in cases of hernia has not received the attention it deserves, although it occurs almost exclusively in strangulated hernia and follows reduction either by taxis or kelotomy. Nevertheless, intestinal hemorrhage has been known to occur after a difficult reduction of large nonadherent hernia, as well as after a radical operation in cases where the omentum was resected. Dieulafoy, Eiselsberg, Castagnol and others have shown that hematemesis may occur in hernia from torsion or resection of the omentum or from a hernial toxoinfection. They are of considerable gravity and frequently fatal.

The pathogenesis of hernial enterorrhagia is very complex, but has been enlightened by clinical, pathological and experimental data. There is invariably an extensive congestion of the walls of the intestinal loops involved in the hernial sac with more or less sanguineous exudation in both the cavity of the sac and lumen of the gut, and for these reasons it is somewhat surprising that hernial hemorrhages are not more frequently encountered. On the other hand, the circulation is interrupted by constriction of the vessels of the mesentery, comprised in the strangulation, especially the venous flow, so that the arterial blood can arrive in large amounts until it breaks through its natural barriers, exfoliating the mucosa by infarcts and thus cause considerable or even fatal hemorrhage. Venous thrombosis brings about the same result.

The afflux of arterial blood, checked by the constriction of the mesenteric branches, can produce the same disorders and consequences at the moment when, the obstacle having been removed, the blood rushes under high pressure into the empty arterial territory which is more or less weakened by ischemia and microbic invasions. The ulcerations on the mucosa of the strangulated loop, which are prone to develop in the sulci formed by the strangulation, may give rise to quite considerable enterorrhagia and intestinal perforation with intraperitoneal collections of blood and peritoneal accidents. The ulcers of toxiinfectious origin—the intestinal loop being a closed cavity—have probably the right to deserve a special place in the etiology of hernial enterorrhagia.

There is a group of late occurring intestinal hemorrhages, arising during the early days following surgical treatment of hernia, whose etiology is not clear. In cases of tight strangulation they seem to be due to deep sulci produced by the stricture of the

gut and on the point of becoming gangrenous, usually in arteriosclerotic subjects. It seems probable that they result from the elimination of the sloughing tissues when the loss of blood is small and is later accompanied by intestinal stenosis, but it is still more likely that they are due to a thrombosis of the vessels resulting in necrosis of the mucosa of the corresponding territories, or perhaps the arrest of the circulation and afflux of blood cause a sanguineous exudation into the lumen of the gut and the peritoneal folds.

The prognosis of hernial enterorrhagia is serious when the loss of blood is considerable and recurs frequently; on the other hand, the prognosis is not serious when the blood is passed in small amounts and at infrequent intervals. On the whole, however, the mortality is quite high. Treatment is both prophylactic and symptomatic. Rest after the operation must be strictly enjoined, and the diet and digestive functions carefully looked after. When the hemorrhage occurs it is to be dealt with by the usual means at our disposal in such cases.

THE WHITE RACE IN THE TROPICS.

It is an argument almost as old as the hills that the white race cannot live in health in the tropics for any prolonged period. While this statement is probably true in the main, it should be accepted with certain reservations. Granted that the black man is physically adapted for life under a burning sun and dry climate and that the white man is not so adapted, yet the manner of life and especially the type of clothing have a good deal to do with the ill health of the Caucasian race in tropical climes. Part II of the British Medical Research Council Special Report Series has this to say on the subject:

As pigment renders the colored man indifferent to sunburn, he can go naked and secure the full cooling power of the environment, with the heat lost by radiation, convection and evaporation, untrammelled by the confined atmosphere of house or clothes. The white man, in so far as he is afraid of sunburn, wears clothes and confines himself in shady, close places, is at a disadvantage from the point of view of heat loss. His customary diet, in particular the amount of protein consumed with its high specific dynamic energy, sets his heat production at too high a level. When a white man enters the tropics he should wear the loosest and lightest clothes and allow himself to become tanned, adjusting his diet and working hours to those of the natives, keeping up his metabolism

by open air exercise in the early morning hours, and sleeping away the heat of the day. He should use double roofed shelters and conveyances with free ventilation of air space between the roofs. He should sleep on roofs exposed to the breeze and use fans to work by. His clothes should be shorts and a white shirt with short, wide sleeves and open at the neck and sides to allow free ventilation. Custom and fashion should not forbid white women to secure in their dress sufficient exposure and ventilation of the body surface. They should take exercise freely, and not confine themselves or their children within houses, or strive to preserve their whiteness of skin. It probably is the stagnant, moist environment produced by clothes and houses which tells against the metabolism and health of women. The men working stripped in the open keep up their metabolism and vigor. A more open air life for women, the better construction of houses and the wearing of clothes as suitable as those worn by the men may prevent these ill effects. Much stress is laid on the thorough ventilation of tropical houses. It must also be remembered that by the elimination of tropical parasitic insect and water borne diseases the tropics can be made far more healthy for whites.

However, there is no evading the fact that from every point of view, the black man or the yellow man is better adapted to the environment of the tropics than the white man. Some of this superior adaptation is due to physical causes, and some of it to the fact that the former clothes himself more suitably, if he wears clothes at all, and chooses food more in accordance with the climate than the white man. After all has been said that can be said on the subject, it seems to be an invariable rule that white people who live in the tropics for a lengthy period deteriorate physically and mentally, and women and children in particular. At the same time there is little doubt that if they adopted the kind of life and clothes and diet best suited to the situation, they would be in better physical and mental health.

The Special Report Series of the British Medical Research Council dealing with white persons in tropical countries is a valuable pronouncement on the subject, and may be recommended for study to those who are thinking of living in the torrid zone. The late Colonel Charles A. Woodruff, of the Medical Department of the United States Army, who had considerable experience of life in the tropics, would have dissented, however, from the views on diet set forth in this Special Report Series. He believed that the white man should not stint himself of meat in the tropics and that there was no need for him to forswear alcohol. Other medical men who have passed a goodly portion of their

lives in lands where the sun beats down the livelong day and the air is arid, do not hold with living on the same food as the natives. In India, for instance, if they tried to follow this rule, they would starve. Probably the wisest mode of life is not to abolish meat from the diet altogether, but to curtail the amount and to eat plenty of vegetables and fruit. As in temperate climes, the diet must be well balanced and in keeping with the altered conditions, and perhaps, above all, the vitamine content must be sufficient. It is the general opinion that alcohol is not needed in the tropics, and it is certain that its abuse is most harmful.

It is well that the question of the white man in the tropics should be carefully studied from the medical viewpoint. The countries with a temperate climate are beginning to be overcrowded, while Africa and South America, teeming with riches, agricultural and otherwise, are underpopulated and in parts almost untouched. The white man must learn how to live in fair health in the tropics, and it is for medical men to teach him how to do this.

THE ANTIPEPSIN THEORY

The resistance of the stomach to autodigestion cannot be explained by any of the older theories—epithelial, protective action of the mucus, the neutralization of the gastric juice by the alkali of the blood, or sweeping away of the ferment by the circulation. The defense against the proteolytic enzymes is a process of a general order. The various organs and tissues of the same animal—intestinal mucosa and serosa, spleen, omentum, gall-bladder—are capable of supporting a prolonged contact with the gastric juice on the condition that the surgical procedure employed has not brought about circulatory disturbances which may result in necrosis of the anastomosis opening. Consequently, the theories of local means of protection which only have in view the defense of the stomach against proteolysis are to be rejected, including that of antipepsin understood in the sense given it by Katzenstein.

Looked at from the more general viewpoint, the antipepsin theory pretends to explain the resistance to hydrochloropeptic aggression from the presence of a specific antiferment in the digestive mucosa and in the circulating blood. This theory, however, can hardly be sustained, since no specific antipepsin exists in the blood serum. The prevention of autodigestion, observed under certain conditions, consists of a simple deviation of the pepsin which in all probability becomes fixed on the colloids of the serum. The albuminoid substances of the serum,

so resistant to tryptic digestion, are quickly attacked by hydrochloropeptic mixtures. Thanks to its great power of absorption of pepsin, the free albumin of the serum may prevent the digestion of coagulated albumen, which serves as a coating although it itself is attacked.

There unquestionably exists in the gastric mucosa, as well as in both natural and artificial gastric juice, an organic substance which hinders peptic digestion and which is quite distinct from salts and albumoses; but from all its characters—pronounced thermostability, resistance to acids and considerable diffusibility to dialysis—it is remote from true antibodies. On the other hand, nothing in its manner of action recalls a reaction between antibodies and antigens. This substance appears to act only by creating a medium unfavorable to pepsin. From the data so far obtained we are not authorized to suppose that this preventive action occurs *in vivo*; many ordinary substances possess *in vitro* a marked influence on peptic digestion, which have no evident action on intragastric digestion.

The antipepsin theory is also met by serious objections in principle. In the present state of our knowledge the theory of biochemical resistance of the living cells appears, at least for the present, the most capable of explaining the antiproteolytic power of the tissues in general, thanks to the chemical anhydrolysable constitution of the living cell or to the absence of affinity for the proteases.

PHYSICIAN AUTHORS: ARMSTRONG AND HILL

Nearly all critics who have examined Dr. John Armstrong's *Art of Preserving Health* are agreed that it is the best didactic poem in the English language. Leigh Hunt and others have given it this honor and Thomas Campbell said of it: "It is the most successful attempt, in our language, to incorporate material science with poetry." Arthur H. Bullen, in the *Dictionary of National Biography* declares that "no writer of the eighteenth century had so masterful a grasp of blank verse as is shown in this poem. The powerful passage descriptive of the plague (book three) has been highly praised. As in all didactic poems, the practical directions are of little interest, but those who value austere imagination and weighty diction cannot afford to neglect Armstrong's masterpiece." Among present day critics there is George Saintsbury, who says: "Armstrong must always have, with competent judges, the praise which belongs to an author who has a distinct and peculiar grasp of a great poetical form."

The author of *The Art of Preserving Health* was

said to be a skillful physician, but not a great success in his profession. This limited success he ascribed to the fact that "he could neither tell a heap of lies in his own praise wherever he went; nor intrigue with nurses; nor associate, much less assimilate, with the various knots of pert, insipid, lively, stupid, well bred impertinent, good humored malicious, obliging, deceitful, waspy, drivelling gossips; nor enter into juntos with people not to his liking." Thus writes one of his biographers, but Mr. Bullen adds that "habitual inertness and a splenetic temperament were probably the real drawbacks to his advancement."

Armstrong was born in 1709 in Castleton Manse, Liddesdale, Roxburghshire, and got his medical degree in 1732 at Edinburgh University, after which he began practising in London. Four years later he published anonymously *The Economy of Love*, a nauseous work which damaged his professional success. This work was considerably toned down in a second edition. Like Smollett, Armstrong also was fond of assailing his professional brethren. His first book *An Essay on Abridging the Study of Physic*, (1735) was a satire on the ignorance of the apothecaries and medical men of his day. He assailed the profession at various other times and in his last work, *Medical Essays*, coarsely charged physicians in general with incompetency and servility. But Armstrong was a clever writer, both in poetry and prose, though all his work, with the exception of *The Art of Preserving Health*, has fallen into neglect. His work, other than that already mentioned, included a tragedy, *The Forced Marriage*, written in 1754 but not published until 1770; *Miscellanies* (1770), containing short poems displaying much humor; *Sketches and Essays on Various Subjects*, published in two parts in 1758 under the pseudonym of *Launcelot Temple*; *A Synopsis of the History and Cure of Venereal Diseases*, and some acrimonious epistles published in pamphlet form.

Armstrong was for many years physician to the Soldiers' Hospital in London and in 1760 he was appointed as a physician with the British forces in Germany. After three years' service in the field he returned on half pay to London and resumed practice. In 1771 he made a Continental tour with Fuseli, a painter, and upon his return wrote *A Short Ramble Through France and Italy*, described as merely a volume of desultory notes. He died in London on September 7, 1779, as the result of a fall.

Contemporaneous with Dr. Armstrong was the notorious Dr. John Hill, whom Nathan Drake called "one of the most extraordinary characters of the eighteenth century." Some other writers have been more outspoken concerning Hill, as, for instance,

Frederick Lawrence in his *Life of Henry Fielding*, who says, "Hill shared with Orator Henley the dubious honor of being the most notorious man of his age," and Samuel Johnson, who called Hill "an ingenious man, but he had no veracity." As a physician Hill's standing seems to have been very low. Sir John Hawkins in his *Life of Samuel Johnson* tells us that "Hill had received no academical education, but his ambition prompting him to be a graduate, he obtained, from one of those universities which would scarce refuse a degree to an apothecary's horse, a diploma for that of doctor of physic." The university in question was that of St. Andrews. Hill had been an apothecary and his chief medical activity after receiving his diploma seems to have been in concocting and manufacturing several quack nostrums, for which he found a ready sale. These included *Pectoral Balsam of Honey*, *Essence of Waterdock*, *Tincture of Bardana*, *Tincture of Valerin* and a number of others.

Despite his unscrupulousness Hill had versatility, ability and perseverance, and he must have had a great capacity for hard work, for both before and after he got his medical degree he did an immense amount of writing of all sorts. In the *Dictionary of National Biography* he is credited with no less than seventy-six separate works, some of them in several volumes. His most ambitious product was a huge botanical work, in twenty-six volumes, called *The Vegetable System*, on which he worked from 1759 to 1775. He presented a set of this work to the King of Sweden, who invested him with the Order of Vasa. From that time on Hill always referred to himself in his writings as "Sir" John Hill. His other writings included many novels and a large number of farces. Because his farce, *The Rout*, was hissed off the stage, he made a series of venomous attacks on David Garrick, the actor and dramatist, whose only reply was this famous couplet:

For physics and farces his equal there scarce is;
His farces are physic, his physic a farce is.

A bitter dispute also was started by Hill when, in 1738, the manager of Covent Garden refused to produce his *Orpheus, an English Opera*, but in the following year produced Theobald's *Orpheus and Eurydice*. But what brought Hill most of his notoriety was his daily letter, headed The Inspector, in the *London Advertiser and Literary Gazette*, which the elder Disraeli described as "a light scandalous chronicle all the week with a seventh day sermon." This scurrilous column involved Hill in quarrels with many of the leading men of his day. When the Royal Society blackballed him he assailed it and its members with extraordinary malice whenever he lacked other prey. Hill died in London on

November 21, 1775, of the gout, a disease for which he had advertised his tincture of barbana to be an infallible specific.

PSYCHOANALYSIS AND QUACKERY

The following timely editorial is reprinted from *The Prescriber* (Edinburgh, June, 1921.)

It appears that a number of morally misguided individuals have discovered a new and lucrative way of living on their wits; they have hit upon the happy idea of floating in on the flowing tide of psychoanalytic ascendancy, of posing as practical psychoanalysts, of extracting fat fees for services of less than disputable value, and so (as the saying goes) "getting money for dirt." A representative of the *Daily Graphic* has, with humor and shrewdness, been making a round of calls upon certain of these up to date impostors, and by describing his neurotic symptoms and hinting at considerable expectations of a pecuniary sort—wholly imaginary in both cases—has succeeded in disclosing their methods of work. It would seem that these *soi-disant* Freudians had absent mindedly overlooked the necessity for acquiring a knowledge of the elements of their science. Instead, they appear to have laid in a copious supply of pseudoscientific jargon, and nothing else. Further, it is pretty evident that somehow they are confusing psychoanalysis with spiritualism—although in reality the two things are mutually exclusive—and a little chat about dreams is followed by the inquiry, Would you not like to be put into communication with the shade of your great great grandmother? Now, it is fairly certain that no great positive harm can be wrought by these ignorant mountebanks. It is the knowledge of psychoanalysis which is power, either for good or ill. The charlatan is comparatively harmless. The only thing he injures is his victim's pocket. Fools will continue to be gulled by knaves to the end of time. Then why bother? The reply is twofold. First, the neurotic, by resorting to the quack, has his cure delayed and his disorder thus accentuated. Secondly, the public has the right to be warned against impostors, especially in the realm of medicine, so that it may know that a practitioner is competent: that, of course, is the whole case for compulsory registration of doctors, dentists, pharmacists, and so forth. There would thus appear to be a clear case for the registration of psychoanalysts, following qualification by suitable means.

MAD SOLDIERS.

All over the city, all over the State of New York, bombs of terrific importance are exploded by those who know, or seem to know, what alarms are piling up slowly to confound us and our boasted progression. The prospect held out for 1927 will make some give money, some flee away in yachts and airships to far away places where insane exsoldiers dwell not and the tuberculous patient does not hack the calm to pieces with his cough. As it is, we are in a parlous state with the civilians who are on the borderland, those who need three living wives, who hurl their babies from the window, with mothers who

vanish, sons and daughters in their lowest teens who hurtle through the town and the daily journals at amazing speed, drug fiends whose career the bar men joyfully watch.

Now comes Colonel Wickersham, investigator of the American Legion, to get an answer to the President's proposed relief legislation for exsoldiers. He begins with the insane exsoldier, and says their increase in the State is 250 new cases a month, also that they are roaming the streets of New York uncared for. The Federal Government has provided 177 beds in Federal hospitals and 759 in State hospitals, the men not getting the right kind of attention in either. The number of new hospital beds needed for disabled men now in unsuitable Government and private hospitals and asylums is 19,240. The peak of necessity is to be reached in 1927, when from 33,000 to 50,000 will need hospital accommodation.

Making deductions from faulty statistics, the prospect of rapidly increasing insanity and tuberculosis makes us picture our various public buildings, museums, art galleries, filled with cases of useless soldiers, because Colonel Wickersham seems to conclude that no efforts will be made to combat disease.

What is an insane soldier? Are all those to be included who, failing to find work, have developed great depression, brooding, indignation, queer habits such as restlessness, insomnia, unreasonable dislikes, apparent laziness, a condition born of not having been fit before they left hospital? These are not, as a rule, madder than the average, and time or a change of environment might restore the mental balance. As to the tuberculous, surely years will show the wisdom of doing what ought to be done and that which officers of health are weary of telling us to do.

THE INDIAN MEDICAL SERVICE.

India, according to her friends in America, is having a horrible time under Britain's brutal rule. Plague, pestilence and famine have been as nothing compared with the horrible treatment ministered by his majesty's representatives, so it is good to learn that the Indian Reform Act will give the native officers of the Indian Medical Service a larger participation in the government of the country. In prewar days of competitive examination the proportion of successful Indian candidates was seven to twelve per cent. Now the candidature is to be by nomination only. Pay for all officers has been increased, also the pension rate. The study leave reserve is increased to twenty-five per cent. for furlough, in addition to two and a half per cent. for study leave. Free passage home means much to a doctor. The Secretary of State has promised the military side of the I. M. S. that they shall be treated as combatant officers, and those in civil employ, the same grantings as other officers in civil employ. Arrears of pay will be paid up, a source of great satisfaction. The Indian Medical Service offers distinct monetary advantages, to compensate for service in the East. Also, there are professorships in the colleges, research appointments in the bacteriological departments, and toxicology appointments. There

is scope for both native and British doctors who have special talent to develop their own particular work. The full advantage as to language, customs, to the natives ought to be a big item in their progress.

A NEW TREATMENT FOR TUBERCULOSIS.

Several series of experiments in the treatment of tuberculosis have been carried out at North Brother Island under the auspices of the Department of Health of the City of New York. A new remedy, called nuforal, has been used, and the results are most interesting. A report of the findings will be published in the *NEW YORK MEDICAL JOURNAL*, October 19, 1921.

OUR CRITICS.

We have received many letters criticizing an article by G. Lenox Curtis, which was published in our July 20th issue. In the current issue we present one of those letters. When Dr. Curtis's article was received we realized that it had no scientific value, but as it was written by a physician practising medicine we decided that it should come to light, in spite of its weird conclusions. We believed that it should be presented before the medical profession and cause a healthy discussion, rather than have it suppressed and cause an abnormal effect by breaking out in other channels. We were sure that it would evoke just the type of criticism which we have received. We regret that we had to give valuable space to such material, but in view of the circumstances we thought it best to let Dr. Curtis express his views, in order that the medical profession might come back at him directly.

News Items.

Cincinnati Health Exposition.—During the week of October 15th, Cincinnati will hold a health exposition under the auspices of the Public Health Federation.

Health Clinics for Country Doctors.—The University of Maryland has made tentative plans for medical extension work by establishing health clinics in the smaller towns, where physicians may see demonstrations of new ideas in medical and surgical practice and receive instruction in certain special topics. The work will be in cooperation with the United States Public Health Service and the Johns Hopkins Medical School.

Meeting of Electrotherapeutic Association.—At the annual meeting held in Washington, D. C., on September 8th, the American Electrotherapeutic Association elected the following officers: Dr. Virgil C. Kinney, of Wellsville, N. Y., president; Dr. Christian M. Sampson, of New Brighton, N. Y., Dr. Elnora C. Folkmar, of Washington, Dr. Charles Read Collins, of Washington, Dr. Howard T. Plank, of Chicago, and Dr. William T. Johnson, of Philadelphia, vice-presidents; Dr. Willard Travell, of New York, treasurer; Dr. A. Bern Hirsch, of New York, secretary; Dr. Byron Sprague Price, of New York, and Dr. Frederick H. Morse, of Boston, trustees.

Meeting of the North Dakota Medical Association.—At the annual meeting, held in Fargo on May 26th and 27th, the following officers were elected for the ensuing year: President, Dr. Harley E. French, Grand Forks; president-elect, Dr. Eric P. Quain, Bismarck; vice-presidents, Dr. William C. Fawcett, Starkweather, and Dr. John H. Rindlaub, Fargo; secretary, Dr. Hezekiah J. Rowe, Lisbon; treasurer, Dr. James P. Aylen, Fargo.

Meeting of Medical Association of New Jersey.—The one hundred and fifty-fifth annual convention was held in Atlantic City, N. J., on June 14th to 16th, under the presidency of Dr. Philander A. Harris Paterson. The following officers were elected for the ensuing year: President, Dr. Henry B. Costill, Trenton; vice-presidents, Dr. James Hunter, Westville; Dr. Wells P. Eagleton, Newark, and Dr. Alexander McAllister, Camden; corresponding secretary, Dr. Harry A. Stout, Wenonah; recording secretary, Dr. William J. Chandler, South Orange; treasurer, Dr. Archibald Mercer, Newark. Dr. David C. English was reelected editor of the society's journal.

Connecticut Psychopathic Hospital.—Plans are being made for the erection of a psychopathic hospital in New Haven, Conn., to be operated in connection with the New Haven General Hospital, now a part of Yale University. According to present arrangements the Rockefeller Foundation and the State of Connecticut will each provide \$500,000 toward financing the proposed institution, while the share Yale University will have in the transaction has not yet been announced. Details will be arranged at the next meeting of the Yale Corporation. Dr. Paul Waterman, of Hartford, is chairman of a commission appointed by the Governor to take charge of the expenditure of the State fund of \$500,000, and Dr. Milton P. Winternitz, dean of Yale Medical School, is a member of it.

Vital Statistics.—During the month of July, 1921, the death rate for the city of New York was the lowest on record for that month. The total number of deaths from all causes was 4,767, compared with the corrected monthly average for July, a decrease of 754 deaths. The following causes showed material decreases: Measles, 24; diphtheria, 21; poliomyelitis, 160; tuberculosis of the lungs, 208; other forms of tuberculosis, 31; lobar pneumonia, 50; other respiratory diseases, 33; diarrheal diseases, under five years of age, 14; Bright's disease, 33; violent deaths, 54. Typhoid fever showed an increase of 1 death; typhus fever, 1 death; whooping cough, 5; cancer, 17; organic heart diseases, 38; appendicitis, 60; puerperal diseases, 12; congenital debility and malformations, 10; sunstroke, 18. There were fifteen deaths reported from encephalitis lethargica, compared with no deaths in the July of 1916-1920. Under five years of age, there were 330 fewer deaths; between five and sixty-five years of age, 420 fewer deaths; and at sixty-five and over, 4 fewer deaths. There were 11,073 births reported during the month, compared with 11,616 during the corresponding month of 1920, a decrease of 543. There were 5,977 marriages reported during the month, compared with 5,240 in July, 1920, an increase of 737.

Personal.—Dr. Russell F. Maddren, of Brooklyn, sailed recently for China to occupy the chair of ophthalmology in the Yale Medical School, Changsha, in the Hunan Province.

Dr. Charles Herrman announces the removal of his office to 685 West End Avenue, New York.

Dr. William George MacCallum, chief pathologist of Johns Hopkins University, returned a few days ago from Tahiti and Moorea, in the South Sea, where he spent five weeks studying the diseases of the natives. He found no malaria or malaria mosquitoes. There were some yellow fever mosquitoes but nobody on the island had ever had this disease.

Dr. Calvin H. Goddard, of Birmingham, Ala., has been appointed second assistant director of the Johns Hopkins Hospital. He succeeds Dr. Arthur J. Lomas, who is now director of the Iowa State Hospital, Iowa City, Ia.

Dr. Francois L. Hughes has been appointed supervising medical inspector of the bureau of health of Philadelphia.

Died.

BALLARD.—In Birmingham, Ala., on Wednesday, August 24th, Dr. Asa N. Ballard, aged seventy-nine years.

BERRY.—In Wheeling, W. Va., on Sunday, August 7th, Dr. Jacob Edward Berry, of Clarington, Ohio, aged forty-six years.

BISHOP.—In Brooklyn, N. Y., on Monday, September 5th, Dr. Gertrude A. Goewey Bishop, aged eighty-three years.

CHAPIN.—In New York, on Sunday, August 28th, Dr. Warren Blanchard Chapin, aged fifty-nine years.

CRENSHAW.—In Atlanta, Ga., on Saturday, August 20th, Dr. Hansell Crenshaw, aged forty-four years.

D'AMICO.—In Somerville, N. J., on Sunday, August 28th, Dr. Americo G. D'Amico, aged thirty years.

DRAKE.—In Easton, Pa., on Friday, August 26th, Dr. Francis James Drake, of Phillipsburg, Pa., aged forty-nine years.

GILMORE.—In Emlenton, Pa., on Tuesday, August 16th, Dr. William G. Gilmore, aged fifty-seven years.

GOSS.—In Athens, Ga., on Wednesday, August 24th, Dr. Isham Hamilton Goss, aged sixty-eight years.

GREEN.—In Utica, N. Y., on Wednesday, August 17th, Dr. Albert W. Green, aged sixty-eight years.

HENDERSON.—In Sardis, Miss., on Sunday, August 28th, Dr. Charles M. Henderson, aged sixty-four years.

KLINE.—In Richmond, Va., on Sunday, August 14th, Dr. Howard W. Kline, aged forty-two years.

KNIGHT.—In Geneva, N. Y., on Thursday, August 25th, Dr. William Knight, aged fifty-seven years.

LUDDEN.—In Colton, Cal., on Saturday, August 13th, Dr. Raymond Ludden, of Kirksville, Mo.

MCGRAW.—In Detroit, Mich., on Tuesday, September 6th, Dr. Theodore A. McGraw, aged eighty-one years.

MCRAE.—In Atlanta, Ga., on Saturday, August 13th, Dr. Floyd W. McRae, aged fifty-nine years.

PATEK.—In San Francisco, Cal., on Thursday, August 25th, Dr. Robert Patek, aged forty years.

PRICE.—In Brooklyn, N. Y., on Tuesday, August 30th, Dr. George Vickers Price.

REDDITT.—In Carrollton, Miss., on Friday, August 12th, Dr. William Joseph Redditt, aged seventy-four years.

SAUVILLE.—In New York, on Sunday, August 28th, Dr. John S. Sauville, aged fifty-nine years.

THOMPSON.—In Pine Bluff, Ark., on Thursday, August 18th, Dr. Arthur C. Thompson, aged seventy years.

TILDEN.—In Omaha, Neb., on Tuesday, August 16th, Dr. George Tilden, aged seventy-eight years.

VEAZIE.—In New Orleans, La., on Thursday, August 11th, Dr. Henry A. Veazie, aged sixty-six years.

WARNER.—In Canandaigua, N. Y., on Tuesday, August 30th, Dr. Franklin Pierce Warner, aged sixty-eight years.

WINGFIELD.—In Salonika, Greece, on Saturday, August 20th, Dr. Russell Stewart Wingfield, of Richmond, Va., aged twenty-six years.

LONDON LETTER.

*(From our own Correspondent.)**More Concerning Venereal Disease—Payment by Patients in Hospitals—The Death Roll of the Great War.*

LONDON, July 2, 1921.

The venereal question is still exercising the minds of the medical profession here. The National Council for Combating Venereal Disease and the Society for the Prevention of Venereal Disease have not come to an agreement as to the best course to pursue in order to check the ravages of syphilis and gonorrhoea, in fact, there seems little likelihood of their being in accord with regard to the means used to prevent the spread of infection. Dr. J. H. Sequeira, the well known London skin specialist, who is physician to the skin department of the London Hospital, some months ago made an extremely valuable contribution to the subject of venereal disease when he opened a discussion held under the auspices of the Royal Institute of Public Health. He dealt with the matter from the point of view of the State and the doctor. He pointed out that the outbreak of the great war in 1914 coincided with the early stages of the antiveneal campaign in Great Britain, and it was soon recognized that venereal disease in this, as in all great wars, would be a very serious problem. As time went on the removal of millions of men from their normal surroundings, the placing of them by tens of thousands in camps in the home country and abroad, the constant stream passing to and from the continent of Europe, produced conditions obviously favorable to promiscuous intercourse and consequently to venereal disease. The hysterical enthusiasm and relaxation of selfrestraint on a part of a section of the female population were also prominent features. Official statistics show that only one third of the venereal disease in the British Army was contracted from professional prostitutes. In spite of all efforts, 340,000 British soldiers had been under treatment for venereal disease during the last four years of the war. After the armistice, the natural desire for early demobilization led to the concealment of a large amount of venereal disease with the result that demobilization greatly increased the number of cases coming to the civil clinics. In Dr. Sequeira's own department at the London Hospital the male patients in 1919 showed an increase of ninety per cent. over the numbers in 1918, while the number of female patients rose fifteen per cent.

The most interesting part of Dr. Sequeira's address was that which discussed preventive measures, indeed so much to the point was it that it will be quoted from extensively. With respect to preventive measures of a special character he spoke as follows: "Science has shown us that the *Spirochæta pallida* and the gonococcus are two of the most vulnerable organisms causing disease. In the male the area of attack in the large majority of cases is easily accessible by simple antiseptic measures. There is no question that the earlier an antiseptic is applied to the area exposed the less is the risk of infection. This axiom holds equally good for the spirochete and gonococcus as for the bacillus of tetanus or any other pathogenic organisms." Among the concrete examples given by the speaker in proof of this statement were these: For the past eighteen

years Dr. Sequeira has had charge of the skin affections occurring in the nurses of the London Hospital. Part of the work of this great charity is a large maternity department. During this period thousands of women have been attended in their homes and in the wards by the maternity nurses. From a knowledge of the prevalence of venereal disease in the district it is certain that many of these nurses must have run the risk of contracting syphilis in their work. Only one nurse has been infected in eighteen years. Why? Because immediately before and after contact with the patient, the hands were disinfected in a one in two thousand solution of corrosive sublimate. No single infection has occurred among the nurses employed in the venereal clinic where patients in the most infective stages are under treatment, again the result of common sense precautions and the efficient use of disinfectants. Dr. Sequeira drew attention to the fact that under the conditions in which venereal disease is commonly contracted it is obvious that immediate disinfection can only be carried out by the individual. The commonest method is the immediate application of Metchnikoff's thirty-three per cent. calomel ointment to the area exposed and of a protargol jelly to the urethral orifice. The efficiency of these remedies was well illustrated in the following report of a former assistant of Dr. Sequeira, Dr. C. E. Jenkins, late surgeon in the Royal Army.

A certain port in the West Indies is such a hotbed of venereal disease that a large vessel which put in there and landed her men for a few hours' leave had 160 cases of syphilis, over twenty per cent. of her complement. These men had no protection. A large cruiser with a crew of 950 visited this port within a week or two and the men went ashore as usual by watches during the week's stay in harbor. These men had been instructed by their medical officer how to prevent infection and by his order the necessary disinfectants were placed unobtrusively at the disposal of the crew. The result of that visit was four cases of syphilis, four of gonorrhoea and twelve of soft sore.

The speaker expressed himself as strongly in favor of educational propaganda on a wide scale and is of the opinion that it should not be a campaign of terrorism. The motto should not be "Fear of Venereal Disease Is the Beginning of Wisdom." Young men should be insistently taught, 1, that chastity is the only certain means of avoiding infection; 2, that continence is consistent with perfect health; 3, that those who indulge in promiscuous intercourse owe it to the community, more than to themselves, to take every precaution against contamination; 4, that infection contracted in illicit intercourse should be held to be evidence of negligence.

In conclusion, Dr. Sequeira urged that the present conditions in Great Britain show the need of an extension of the campaign against venereal disease. Speaking as an individual and in no sense as representing the views of any society or association, he would like to see an approach to the conditions now obtaining in the Dominions, especially in the following directions: 1. To make it obligatory for all persons infected with venereal disease to present themselves for treatment within a given period either

at the free clinics provided by the State or by a private practitioner, and to continue under treatment as long as necessary to render them free from infection. To enforce these obligations notification may be necessary. Such notification should be at first anonymous but in the recalcitrant by name to the sanitary authority who should be able to obtain the necessary powers to enforce compliance. 2. Power should be given to compel persons reasonably suspected of suffering from venereal disease in an infective stage to undergo treatment, e. g., a husband when the wife is under treatment, or a parent whose child is found suffering from the disease. Proceedings, if any are necessary, should be in camera, and heavy penalties should follow fake allegations. 3. The law should be altered so that disinfectants for the prevention of venereal disease may be sold by chemists. 4. Support should be given to the action taken by the municipality of Portsmouth to spread a knowledge of the means of self-disinfection.

Dr. Sequeira is convinced from experience that both syphilis and gonorrhoea are amenable to proper preventive measures, the use of an appropriate disinfectant, if these measures are employed in time. However, this point is agreed upon by all authorities and it is also the universal opinion that the sooner disinfecting methods are used after intercourse the less likely is infection to occur. Consequently, immediate self-disinfection, as urged by the Society for the Prevention of Venereal Disease, if properly carried out, is the only sure means of preventing infection. The crux of the problem is, can such disinfection be carried out effectively by civilians? The answer of those who advocate this means of prevention is, that when the public have been instructed how and when to use the disinfectant that it can be carried out successfully, so far at least as greatly to impede the spread of venereal infection. As Dr. Sequeira pointed out in his address, immediate self-disinfection is now carried out by a large number of persons on the advice of their medical advisers. After all the object is to prevent, as far as possible, the spread of venereal infection. The fear of the consequences has not prevented it nor have moral scruples. It is not a question of the individual, it is a question of the entire community; more than that, it is the outstanding international medical question, the solution or partial solution of which will be of untold value to the entire human race.

* * *

A court of governors of the Middlesex Hospital was held on May 26th last, when the experience of the hospital with regard to paying patients was discussed. It was stated by the chairman that the governors now had full and interesting statistics of the first three months' working of the new scheme by which all patients are required to contribute according to their means towards the cost of their maintenance. The results of that period show contributions received at the rate of over £10,000 a year, and a further improvement might be expected when the scheme had been longer in working order, and was more generally and thoroughly understood by all classes of patients. Meanwhile, it was gratifying to know that the adoption of this policy had been

approved by a large number of governors, and had been willingly accepted and even welcomed by the contributors themselves. It was pointed out that important financial questions affecting voluntary hospitals to a considerable degree were now before the committee of inquiry appointed by the Ministry of Health. The findings of this committee and their adoption by the Government should exercise a marked influence upon their immediate financial conditions. Whatever the outcome, however, the chairman went on to say, and taking into account the anticipated revenue from patients' contributions, the hard fact still remained that the working of the hospital on its present system must necessarily depend upon the voluntary efforts of the community. As the public come to realize more fully the value to them of voluntary hospitals, especially those equipped with adequate facilities for scientific and medical research and with medical schools attached, and also to realize their responsibility in maintaining such hospitals at their present high standard of efficiency, they hopefully anticipated a sufficient measure of support from that source. The inquiry by the committee appointed by the Ministry of Health will doubtless throw a good deal of light on the hospital question, and it is certainly to be hoped that suggestions may be made which will help to solve the problem. At the same time, everything goes to show that to depend mainly upon voluntary contributions to support the hospitals is to lean upon a broken reed. The people who formerly gave cannot do so now because they have not the money to give, and those who can give do not appear to be willing. There is scarcely a hospital in the country that is not heavily in debt, and so far no workable scheme has been brought forward to place matters on a sound basis.

* * *

A parliamentary return has been issued recently, showing the total number of enlistments from within the British Empire for the Great War, and the number of deaths and other casualties, the figures embracing not only the armies, but the mercantile marine. The following is a summary of the table:

Country	Enlistments		Deaths			Total
	All Ranks	From All Causes	Wounded	Prisoners	Casualties	
Great Britain and Ireland	6,211,427	744,702	1,693,262	176,305	2,614,269	
Canada	683,170	56,625	149,732	3,754	210,111	
Australia	413,453	59,330	152,171	4,084	215,585	
New Zealand	227,325	16,136	40,729	502	57,367	
South Africa	136,373	8,832	15,153	1,718	25,708	
Newfoundland	9,869					
Other Colonies and Total Dominions	135,337					
India	1,605,527	140,923	357,785	10,058	508,766	
Total	1,679,416	61,398	70,859	11,070	143,327	
Total	9,496,370	946,023	2,121,906	197,433	3,266,362	

The following table gives the nearest figures available for all the countries engaged in the hostilities, excepting Japan and Russia:

Country	Deaths	Wounded
Germany	2,050,406	4,202,028
France	1,385,300	3,620,000
Austria	1,200,000	3,620,000
British Empire	946,023	2,121,906
Italy	460,000	947,000
Rumania	335,706	.....
Turkey	300,000	870,000
Serbia	127,535	133,148
United States	115,660	205,690
Bulgaria	101,224	152,400
Belgium	38,172	44,686
Portugal	7,222	13,751
Total	7,097,048	15,930,609

Book Reviews

PSYCHOPATHOLOGY.

Instinct and the Unconscious. A Contribution to the Biological Theory of the Psychoneuroses. By W. H. R. RIVERS, M. D., D. Sc., LL. D., F. R. S., Fellow and Prælector in Natural Sciences, St. John's College, Cambridge. Cambridge: The University Press; New York: The Macmillan Company, 1920. Pp. viii-252.

This work is of great interest. It presents the views of a worker who entered the field of psychopathology during the war and great credit should be given him for the ground he has covered and the more or less progressive attitude he has taken. To the worker well grounded in modern psychopathology the book should prove helpful, but to the novice and to one who is not sure of his ground or who does not know the various theories which Rivers attempts to set forth—e. g., psychoanalysis and suggestion—harm may be done. This harm cannot be lasting, however, for the careful worker will soon find the weaknesses of the doubtful points brought out by Rivers.

He seems inclined to accept the findings of Freud, but when it comes to the stress of the sexual conflicts, with their many sublimations and ramifications, Rivers is tempted to step aside and attempt a rationalization on some other basis. He quotes cases in which the patients were cured by catharsis who had resisted so-called psychoanalytical treatment, where blatant attempt had been made to place the entire situation on an obvious sexual basis. The example given is hardly fair and the proof is far from convincing. First of all, he justly criticizes the methods of another worker who was a victim of technic rather than a master; secondly, from the anamnesis given it is clear that the phobia of the patient which is attributed to a straightforward fear reaction had a definite sexual basis. The sexual significance is not obvious, for the affective fear reactions were brought about by objects or persons which were symbolic of persons or objects bound up in the patient's sexual conflicts. The initial inferiority, he would find on more careful examination, was due to an initial inferiority caused by the successful rival; the rival for the love object—usually the father directly and not infrequently a father image. It is understood that Rivers did not have an opportunity to go into the cases he describes thoroughly enough to work out these problems. A better opportunity would be had under other more favorable circumstances. The practical results he had were undoubtedly better with the methods he employed than they would have been had he attempted to go into the matter more extensively. His methods were more nearly allied to those of the new Nancy school than to those of straightforward analysis. The new Nancy school also uses psychoanalysis as part of their technic, but they then put the entire matter on a pernicious basis by using suggestion as a cornerstone of their edifice. They, too, get good results, but they do not give the patient an insight into the true state of affairs, nor do they add to the material which is

being brought to the surface for use in the future.

Rivers attempts to divide hysteria into two groups, according to etiology. It is safe to assume that he will be well content to keep them in one rather compact group when he reaches the bed rock of the real etiology of the malady. He assumes that the cases of hysteria he saw were all brought about by a fear reaction. This reaction he likens to a modification of the reaction of immobility, a reaction analogous to the epicritic modification of the more primitive protopathic reaction which it supersedes or tends to absorb. This idea is a good one, but why does he assume that the hysteria found in civilian practice is different merely because it is more common among women? After all, why not allow that the hysteria is an unconscious mechanism having for its purpose the attaining of some craving of lower segments? An obstacle has been encountered, a difficulty which cannot be overcome, then the unconscious machinery is put into play. Mutism, anesthesia, paralysis, and any number of somatic manifestations may occur. They are all symbols of attaining an object craved or rejecting something which cannot be faced. When we consider more carefully what the patient is trying to do—consciously or unconsciously—we will come more nearly to working out the problems on a basis of simplicity and better understanding. The attempt to simplify or change some of the more common terms which have been accepted by the modern workers in psychopathology will lead to confusion. No doubt Rivers had an object in making this effort, but a reconsideration should show him how confusing it would be if an attempt were made to conform to his new classifications. We have too many classifications now; what we want is a better understanding of the underlying mechanisms. In spite of these shortcomings, which Rivers himself will one day admit, for he is earnest and capable and at times brilliant, the book should be widely read, as it is stimulating and very well written.

URINARY ANALYSIS.

Urinary Analysis and Diagnosis. By Microscopical and Chemical Examination. By LOUIS HEITZMANN, M. D., New York. Formerly Professor of Pathology and Bacteriology, Fordham University School of Medicine, New York. Fourth Revised and Enlarged Edition. With One Hundred and Thirty-one Illustrations, Most of Them Being Original. New York: William Wood & Co., 1921. Pp. xii-362.

This work, well known for some years, comes to us in its fourth edition, revised and enlarged. While no extensive changes have been made, the author has added a number of new chemical tests which have been found useful and of proved value. A number of old illustrations have been replaced by new ones.

As in previous editions, the author lays the greatest stress on microscopic diagnosis. He still insists that while it is manifestly impossible to diagnose the origin of every single epithelial cell found in the urine, nevertheless by far the greatest number can

be located accurately and valuable deductions derived therefrom. He urges the employment of high power microscopic studies of the urine, no less than four or five hundred diameters being advised. By this means the various cellular elements can be recognized and their source determined, thus ensuring correctness in diagnosis, especially in doubtful cases. These microscopic examinations of the urine are, in the opinion of the author, of greater value than the most painstaking chemical examination.

Exception will be taken to some of the statements made in this volume, such, for instance, as that regarding the diagnosis of prostatic hypertrophy, which, it is said, can be made by the microscopic examination of the urine "especially when the age of the patient is above forty or forty-five years."

The work is a most interesting and useful one, even though it might be charged with extravagances based on the personal enthusiasm of the author.

RELATION OF SOCIETY TO MENTAL DISEASE.

Social Aspects of the Treatment of the Insane. Based on a Study of New York Experience. By JACOB A. GOLDBERG, Ph. D. New York: Columbia University and Longmans, Green & Co.; London: P. S. King & Son, Ltd., 1921. Pp. 247.

This book should serve several most necessary ends. It first of all fulfills the writer's purpose in putting directly into the hands of many everyday workers, those who are coming forward in ever increasing numbers to meet the needs of a mental hygiene for the community, a concise yet very clear statement of certain facts needed for daily equipment for their tasks. These facts are the actual condition of affairs in the treatment of those mentally ill in the state of New York, and with this general background, certain important facts both of mental diseases and of their treatment by the hospital or the larger body of society are stated. The study presents a brief review of the subject in its larger setting but purposely confines itself to one state and to one particular group in the state. This makes it of more distinctively practical value by permitting greater definiteness in handling the material and the drawing of such material from the author's own contact with it in his investigations. It therefore makes his particular study typically illustrative of the subject of society's relation to mental diseases.

The writer has discussed statistically and briefly in theory the incidence of insanity among the Jews, not because he has any particular theory to set forth or any special emphasis to lay upon mental diseases within this group, but only because his study has fallen among members of this race. While this necessarily opens up to a slight extent the question of any particular tendencies toward mental disease which may exist among them, it permits of general lessons to be drawn from one of any number of groups that might have been chosen. With this group as a basis the various aspects of insanity and the obligations of society toward it are brought forward in the discussion of commitment of patients to hospitals, in a review of the care and methods of treatment at such hospitals, questions of discharge, following up of patients, readmissions, the duties

toward patients' families. The chief forms of mental symptom groups are briefly gone over, together with chances for recovery in them or possible relapse. Then a survey is made of the large number of cases which have been available for this study and which are here discussed chiefly in this relation of society's duty toward them.

In summing up the writer calls attention to the inadequacy as to means and to method of the present facilities in dealing with the great problem. He pleads for more attention to prophylactic work and less of the diverting of available funds merely to stop up holes already made in the mental health of the community. Mental hygiene has, he says, as yet far too little hold on the attention of society. Then, more definitely, clinics should be more intelligently established, there should be provision for convalescent care, a workshop where patients can make a new adjustment to active life, and there should be a psychopathic hospital where patients can be received, observed, and treated who otherwise would drift on without care into serious illness.

The writer's recommendations deserve earnest thought. He has surely voiced crying needs in a community such as that in which he makes his special plea, that of New York city. He has put the problems simply with such emphasis on the facts about him as well as upon the statements of authorities upon the subject of mental diseases that no one can pass them by. There is much that might be said further of the problem of the disease forms themselves, and not the least of these are the borderline and incipient cases for which he makes special plea. He might have added something more penetrating right here as to the meaning of mental disease and the possibility of reaching the difficulties through an understanding of that fact. For this is of utmost importance in considering treatment whether preventive or curative.

A MUMMER'S TALE.

A Mummer's Tale. By ANATOLE FRANCE. A Translation by Charles E. Roche. London and New York: John Lane Company, 1921. Pp. 240.

"The scene was an actress's dressing room in the Odéon. . . . Dr. Trublet, the physician attached to the theatre, and a friend of the actress's, was resting his bald cranium on a cushion of the divan, his hands folded upon his stomach and his short legs crossed." So runs the beginning of the story that Anatole France tells us, an uncommon story and told with all the beauty that France can muster. For here he goes to a world of unreality, for the setting of his quaint *histoire*, and then projects his egocentric figures into a further world of phantasy of their own making. Dr. Trublet is the philosopher in the background who attempts to neutralize the fears and the narcissistic cravings of the weaklings who fear their own projected conscience. In spots we see the more basic underlying motifs which serve as wellsprings of the disorders which breed phobias and other mental disorders. A clue might be gleaned from the following: "Do not blame me, Cecile; I felt for you a friendship dating from childhood, one of those fraternal friendships which impart to the love which springs from them a dis-

quieting appearance of incest." "Incest" shouted Pradel, "you cannot let the word 'incest' remain, Monsieur Constantin Marc. The public has susceptibilities of which you have no idea. . . ."

Again we have the dialogue between the physician and Constantin Marc which tells us more than any comment could.

Says Marc: "Excuse me! Since you are speaking of the action of alcohol, I should like your advice on the subject. I am in the habit of drinking a small glass of Armagnac brandy after each meal. That's not too much, is it?" "It's a great deal too much. Alcohol is a poison. If you have a bottle of brandy at home, fling it out of the window." Pradel was pondering. He considered that in suppressing will and responsibility in all human things Dr. Socrates [Dr. Trublet] was doing him a personal injury. ". . . Will and responsibilities are not illusions. They are tangible and powerful realities. I know how the terms of my contract bind me and I impose my will on others. I believe in the will, in moral responsibility, in the distinction between good and evil." The doctor's final comment on this is that the ideas are "stupid, venerable ideas. Men have felt that, without these ideas, they would all go mad. They had only the choice between stupidity and madness. Very reasonably they chose stupidity. Such is the foundation of moral ideas."

So France takes us through tortuous pathways, flinging his spears of philosophical irony. He wends his way through sordid love affairs and the shallow life of the play people of the stage; through their infantile superstitions which to many may appear as mockery; through narrow hallways into the cramped rooms which shelter sordid intimacies; through to the end of remorseless remorse and the revenge of dementia and neurosis. Throughout we find the actor and his own world of selfdelusion. And old fat Socrates can scarcely wait for his cue to bring in an ironical comment.

It is seldom that a work of this character is so commendable to the physician. It serves as a study of humanity, not alone the humanity of the stage, but of the mental processes of all who have a tendency toward exhibitionism, and who of us can say that we do not possess in part these traits?

ANOTHER CAPE COD STORY.

Galusha the Magnificent. By JOSEPH C. LINCOLN, Author of *Shavings, The Portygee, Extricating Obadiah, Mary 'Gusta*, etc. New York and London: D. Appleton & Co., 1921. Pp. 407.

Mr. Lincoln has written another delightful story of Cape Cod folks, in which Galusha Cabot Bangs, the absentminded archæologist, is dropped, rather unceremoniously, into the hands of Miss Martha Phipps of East Wellmouth, Mass. Galusha is the typical scientist, shabby in dress, caring nothing for money, and living wholly in daydreams in the land of the Pharaohs. An excellent plot is afforded by the affairs of Cap'n Jethro, the lighthouse keeper, who is interested in spiritualism and being duped by local mediums, the love affair of his daughter, and Miss Martha Phipps's investment in a rather dubious land development enterprise. Galusha, being a relative of the wealthy Cabots of Boston, is able to unravel the local tangles. He is altogether a

lovable character and his ability to be able always to command a situation wins for him the title "Galusha the Magnificent." The story is a very entertaining one of typical Cape Cod life.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

HUMAN HEREDITY. By CASPER L. REDFIELD, Author of *Control of Heredity, Dynamic Evolution, Great Men*, etc. Chicago: Heredity Publishing Company, 1921. Pp. xi-110.

RADIANT ENERGY AND THE OPHTHALMIC LENS. By FREDERICK BOOTH. Introduction by WHITEFIELD BOWERS, A. B., M. D., Formerly Major, M. C., U. S. A. Two Hundred and Thirty Illustrations. Philadelphia: P. Blakiston's Son & Co., 1921. Pp. xxvii-226

A HISTORY OF PSYCHOLOGY. By GEORGE SIDNEY BRETT, M. A. (Oxon.), Professor of Philosophy in the University of Toronto. Volume III: Modern Psychology. London: George Allen & Unwin, Ltd.; New York: The Macmillan Company, 1921. Pp. 322.

AIDS TO ELECTROTHERAPEUTICS. By J. MAGNUS REDDING, F. R. C. S., Surgical Radiographer, Guy's Hospital; Late Assistant in X Ray Electrotherapeutic Departments, Charing Cross Hospital, etc. New York: William Wood & Co., 1921. Pp. viii-196.

HENRIK IBSEN. A Bibliography of Criticism and Biography with an Index to Characters. Compiled by INA TEN EYCK FIRKINS. Reference Library to the University of Minnesota. New York: The H. W. Wilson Company, 1921; London: Grafton & Co. Pp. 80.

FOUNDATIONS OF PSYCHIATRY. By WILLIAM A. WHITE, M. D. With an Introduction by Dr. STEWART PATON. Nervous and Mental Disease Monograph Series, No. 32. New York and Washington: Nervous and Mental Disease Publishing Company, 1921. Pp. ix-136.

THE TECHNIC OF PSYCHOANALYSIS. Nervous and Mental Disease Monograph Series, No. 26. By SMITH ELY JELLIFFE, M. D., Ph. D. Second, Revised and Enlarged, Edition. New York and Washington: Nervous and Mental Disease Publishing Company, 1920. Pp. xi-171.

A GUIDE TO DISEASES OF THE NOSE AND THROAT, AND THEIR TREATMENT. By CHARLES A. PARKER, F. R. C. S. (Edin.), Consulting Surgeon to the Throat Hospital, Golden Square, W., and LIONEL COLLEDGE, M. B., F. R. C. S., Surgeon to the Ear and Throat Department, St. George's Hospital, S. W., and to the Throat Hospital, Golden Square, W. Second Edition. London: Edward Arnold, 1921. Pp. xv-583.

THE ALLEN (STARVATION) TREATMENT OF DIABETES, with a Series of Graduated Diets. By LEWIS WEBB HILL, M. D., Junior Assistant Visiting Physician, Children's Hospital, Boston; Alumni Associate in Pediatrics, Harvard Medical School, and RENA S. ECKMAN, Dietitian, Massachusetts General Hospital, Boston, 1911-1916. With an Introduction by RICHARD C. CABOT, M. D. Fourth Edition. Boston: W. M. Leonard, 1921. Pp. vii-140.

OPERATIVE SURGERY. For Students and Practitioners. By JOHN J. McGRATH, M. D., F. A. C. S., Professor of Surgery, Fordham University; Consulting Surgeon to the People's Hospital; Visiting Surgeon to the Fordham, Columbus, and New York Foundling Hospitals; Fellow of the American College of Surgeons; Fellow of the New York Academy of Medicine; Member of the American Medical Association Sixth Revised Edition. With Three Hundred and Sixty-nine Illustrations, Including Full Page Color and Half-tone. Philadelphia: F. A. Davis Company, 1921. Pp. xvi-863.

Practical Therapeutics

TREATMENT OF TUBERCULOSIS WITH DERIVATIVES OF CHAULMOOGRA OIL.

Preliminary Report of Cases.

BY THOMAS J. BEASLEY, M. D.,
Indianapolis.

The valuable work which has been accomplished in the last two years in the treatment of leprosy with derivatives of chaulmoogra oil has aroused much interest and speculation as to the applicability of this agent in the treatment of tuberculosis. It has been found by McDonald that the ethyl esters of chaulmoogra oil, as developed by Dean, are effective in the treatment of leprosy, and the demonstrations of Walker and Sweeney have shown that the bactericidal action of this agent extends to many acid fast bacteria, but not to nonacid fast bacteria. It would then appear rational to attempt the application of this treatment to tuberculosis, inasmuch as the two diseases are closely related in many ways. Since time out of mind they have been referred to as first cousins.

After reviewing carefully the recent literature upon the treatment of leprosy, and having had an extensive hospital training in the tropics, where I came in contact with many cases of leprosy, I have made a comparative study of the two diseases. This comparison would lead us at least to hope that any agent which will prove curative in the one would be applicable to the other.

There is a marked similarity between the pathology of leprosy and tuberculosis. We find each following a course of an ulcerative necrosis. They both are characterized by the development of tubercles, which only in minor ways differ from each other, and so nearly alike are they in both diseases that we find they are capable of invading any organ or tissue of the body. They are also alike in their geographical distribution, being found all over the world.

The bacilli of leprosy and the bacilli of tuberculosis are greatly alike in their morphological appearance, each being surrounded by a fatty acid capsule. Their staining characteristics are much alike. The lepra bacilli are more easily decolorized by acids than the tubercle bacilli. The cultural characteristics of these two bacilli are very similar.

The empirical use of chaulmoogra oil in the treatment of leprosy has come down through the ages, and it has been proved by McDonald and Dean that the ethyl esters of this oil represent its specific properties and that their administration has a marked and specific activity in destroying the lepra bacillus *in vitro*.

McDonald (1) reports that since October 1, 1918, seventy-eight patients who received this form of treatment have been dismissed as cured and paroled by the Territorial Health Board. Not one of this number has shown the first signs of relapse. McDonald's work included careful and frequently repeated examination for the lepra bacilli taken from

the lesions of patients under treatment, and he has noted that bacteriological slides made from new patients disclose myriads of well defined bacilli of even homogeneous stain and of practically even length, showing scarcely any morphological differences. In contrast to this he noted the changed appearance of the bacilli in specimens taken from patients who for several months had been under intensive treatment with Dean derivatives of chaulmoogra oil. The greater number of the bacilli were found to have undergone destructive changes which caused them to take the stain only in segments, becoming in due time simply a row of bright red dots. When masses of them were crowded together there was a characteristic granular appearance in which the rodlike appearance was entirely lost.

McDonald calls attention to the fact that this phenomenon is also frequently observed in tubercle bacilli. This morphological change in the tubercle bacilli was first described by Koch and named by him moniliform, or "like a string of beads," and has been regarded as representing destructive changes in the fatty capsules of these bacilli.

McDonald further observed that later on after additional months of treatment the bacilli nearly cease to be acid fast and present in a microscopic field not a single normal bacillus. In the early cases of leprosy examined by him, he states that it is the rule not to find any instances of beaded and granular bacilli, and gives it as his conclusion that along with and in proportion to the amelioration of the clinical symptoms of his patients under treatment with the ethyl esters of chaulmoogra oil the foregoing changes in the bacilli regularly take place, and that they finally disappear altogether.

Walker and Sweeney (2) report that they have made very extensive laboratory investigations for the purpose of discovering the method of action of chaulmoogra oil, to identify and isolate the therapeutic active principle, if such exists, and to determine its distribution in other animal and vegetable oils. The report of these two investigators was concerned exclusively with a study of the antiseptic and bactericidal action of chaulmoogra oil and its derivatives, together with the identification and isolation of the bactericidally active substances of chaulmoogra oil, the determination of the specific bactericidal action on acid fast bacilli, and an investigation of the presence or absence of this bactericidal substance in codliver oil and other oils.

For testing the antiseptic and bactericidal activity of chaulmoogra and other oils and their constituents, cultures of the following acid fast bacilli were employed: *Bacillus lepra muris* (Hollman), *Bacillus lepra hominis* (Levy), *Bacillus smegmatis*, *Bacillus lymphangitidis boris* (Traum), *Bacillus tuberculosis avis*, *Bacillus tuberculosis bovis* and *Bacillus tuberculosis hominis*. They found that sodium chaulmoogrates killed the bacillus of rat leprosy in twenty-four hours up to a dilution of 1-75,000, but a dilution of 1-100,000 of the chaulmoogric acids was

not effective. They concluded that probably the limits of complete bactericidal action *in vitro* of the chaulmoogric acids on this bacillus lie somewhere between 1-75,000 and 1-100,000.

These workers also made attempts to obtain data on the bactericidal action of the chaulmoogrates on the *Bacillus tuberculosis hominis* by the combined *vitro* and *vivo* method. These experiments consisted in subcutaneous inoculation of a number of guineapigs with five tenths c. c. of saline suspension of the tubercle bacilli which had been subjected to the action of definite dilutions of the chaulmoogrates for twenty-four hours at 37.5° C. The controls were inoculated with the same amount of untreated saline suspension of the tubercle bacilli. These experiments show a complete bactericidal action of the sodium salts of the total fatty acids of chaulmoogra oil on *Bacillus tuberculosis hominis* (only up to a dilution of one to twenty thousand). They call attention to certain dangers of error in these experiments.

The work of these two investigators was extended to a study of the antiseptic and bactericidal action of chaulmoogric acids on nonacid fast bacteria. These experiments show that the sodium chaulmoogrates are antiseptically and consequently bactericidally inert against nonacid fast bacteria in dilutions as low as one to one hundred. In such dilution the growth was usually found to be as luxuriant as in controls.

Walker and Sweeney summarize their findings in the following statements:

"Chaulmoogra oil contains bactericidal substances that are about one hundred times as active as phenol. The bactericidally active substances of chaulmoogra oil are the fatty acids of the chaulmoogric series, chaulmoogric and hydrocarpic acids and possibly lower isomers of this series. The bactericidal activity of the chaulmoogric acid series is specific for the acid fast group of bacilli, and, together with the clinical results obtained from their use in treatment of leprosy, furnish theoretical grounds for the application of the chaulmoogrates to the therapy of tuberculosis."

Kolmer, Davis and Yager (3) report the following observations:

"Undiluted chaulmoogra oil (*Taraktogenos kurzii* King) and dilutions in paraffin oil, had no appreciable germicidal influence *in vitro* on a strain of bovine tubercle bacilli, according to the results observed with technic employed in these experiments. Undiluted and diluted chaulmoogra oil had no appreciable germicidal effect on virulent tubercle bacilli as determined by an *in vitro-vivo* method, employing guineapigs. Chaulmoogra oil in doses of 0.2 c. c. to 100 grams of body weight, administered by intramuscular injection at weekly intervals (equivalent to 2 c. c. to the kilo or 120 c. c. to 60 kilos), had none or but slight effect on the course of tuberculosis in infected guineapigs. Chaulmoogra oil is relatively nontoxic for guineapigs; animals have borne at least eleven intramuscular injections of 0.2 c. c. to 100 grams without deleterious effect, except localized inflammatory changes at the sites of injection."

An interesting feature of the review of the recent literature upon this subject shows that the bacteri-

cidal action toward acid fast bacilli did not develop in experiments with crude chaulmoogra oil, but this bactericidal action against acid fast bacilli was observed when the miscible or absorbable ethyl esters or sodium salts of this oil were used.

In view of these developments in the chemotherapeutics of chaulmoogra oil and the marked similarity of these two diseases, I have felt warranted in attempting to determine by clinical test if the derivatives of this oil would be of therapeutic benefit in the treatment of tuberculosis, and in pursuit of this purpose have prepared, according to the method of Dean, the ethyl esters of chaulmoogra oil, and now have ten patients receiving this form of treatment. This paper is presented as a preliminary report upon this work, as I desire at this time to outline briefly the scope of the work undertaken and the means of recording the findings observed, which will be the subject of a more complete report later.

To be worth while, I am aware that a large number of patients must be treated, and those that thus far have been selected have been chosen to represent the various types and stages of the disease, ranging from those that have the disease in the incipient stages to those whose condition is far advanced. The final test that will standardize the value of this procedure, like that of leprosy, will be microscopical findings. Specimens of sputum from each patient are examined before they are placed on the treatment, and each week thereafter reexamination of sputum is made. Each of these specimens is permanently mounted in order to afford comparative study and to give us the opportunity of determining if any destructive changes occur in the fatty capsule and body of the bacilli. Microphotographs can be taken of these permanent mounts at a subsequent time.

The preparation used in this work is the ethyl esters of chaulmoogra oil, prepared by the method of Dean. The work has been under way since November, 1920. Ten patients are now receiving the injections, and, while it is too early to arrive at definite conclusions as to the value of this agent in tuberculosis, the following observations have been noted:

The preparation is well borne. Even in an advanced case, with great emaciation and hence very little muscular structure in which the injections could be given, there was no complaint of pain and there has not been any marked or annoying induration or infiltration of tissue, although the same site has been used repeatedly for injections. I gave myself one c. c. injection hypodermically, which caused considerable pain and much subsequent discoloration of adjacent tissues, thus proving that, while this preparation is well borne intramuscularly, it is not suitable for subcutaneous administration. No reactions have followed any injections, except that in two patients there occurred a very marked reaction in the infected lungs. These reactions were similar to those observed following too large a dose of old tuberculin.

In these two instances the amount of moisture in the areas involved in the tuberculosis process was much increased, causing increase in cough and ex-

pectoration. There was general muscular aching and malaise. The temperature ascended about two degrees higher than its former average. These manifestations were carefully observed, and it was pleasing to note their general subsidence and a return within a few days to the same clinical condition that had existed before the reactions. In one of these patients that reacted in this way there has been a decided improvement in the general clinical picture since this reaction occurred. The other was a far advanced case, and the patient, as was to be expected, has become now much as he was before the reaction, showing no improvement.

This observation has been interesting and valuable, and is taken as proof that it is possible with this preparation to cause a focal reaction at the site of the disease and hence lead one to suspect more strongly, since this is true, that it is capable of doing good. Nevertheless, while these reactions promptly subsided and resulted in no harm to the patient, they should serve as a warning as to the proper dose, and be recognized as indicating that the dose of this preparation for tuberculosis patients should be very small at the beginning and cautiously increased as tolerance is established, in order that such marked reactions be avoided. McDonald has called attention to a similar reaction in leprosy, and has made the observation that leprosy patients who so reacted showed marked improvement afterward.

The apparent, primary effect of the injections is first to cause a decided increase in the amount of cough and expectoration. After a few injections the cough and amount of expectoration decrease, and in this connection it has been noted that frequently there is a marked increase in the number of tubercle bacilli found in each microscopic field. This increase in the number of bacilli coincides with the decrease in the quantity of sputum. This lessening of moisture is easily detected by stethoscopic observations, and in two patients has proceeded to the point where there is almost no cough or expectoration. This has been regarded as very favorable, as in these two patients the disease was of long standing with extensive involvements, and they had not done well before the injections were begun. There has as yet been no change noted in the morphological structure of the tubercle bacilli, but I would regard it entirely too early to expect such findings. As McDonald states, it was after several months' treatment that he was able to note the changed appearance of the lepra bacilli.

In one case of extensive, cervical, tuberculous adenitis, in which there was much suppuration and discharge, it was observed that the thick purulent discharge promptly lessened, and after the third injection there was only a serosanguineous discharge with marked diminution in the size of the adjacent glands. In this patient there was also a tuberculous process involving the two lower lumbar vertebrae, and it was noted that the discharge from the sinus leading to this focus of infection had changed, as did that from the cervical glands.

One patient who had an extensive active pulmonary tuberculosis, with frequent hemorrhages of four years' duration, had attained a very satisfactory arrestment of the disease by the intravenous use of

calcium chloride, except that there was left a moderate sized cavity in the middle lobe of the right lung, which caused no ill effects, except that at intervals, varying from one to three weeks, this cavity would spontaneously open into a bronchus and discharge about half a pint of thick, bloody pus. On my suggestion her physician placed her on injections of the ethyl esters of chaulmoogra oil, beginning with one half c. c. and gradually increasing to forty minims, injecting each fifth day. The injections have been continued over a period of seven weeks, and during this time the cavity has opened only once, discharging then about half the quantity that it had been discharging in the past four years. The patient's general condition is now much better than during the past two years. The injections have been given each fifth day. The beginning dose is a half c. c. and is gradually increased; the maximum dose is six c. c. The injections are given intramuscularly into the deep gluteal muscles.

Intervening between the injections of ethyl esters of chaulmoogra oil, half the patients on this form of treatment are also given intravenous injections of calcium chloride (4). The remaining patients are given only the injections of chaulmoogra oil, hoping in this manner to be able to determine if the combination of these two forms of treatment would produce better results than if only one is given.

I have been guided in this for the last six years by the thought that calcium does bear a definite relationship to the healing of tuberculous lesions. If there are those who deny this, let them afford another explanation for that peculiar but usual phenomenon that compounds of this base are found to be so uniformly deposited in tuberculous lesions.

If we would carefully consider what actually happens in the development of a primary tubercle, with its myriads of tubercle bacilli, surrounded as they are with their fatty acid capsule, it would appear that they must be able to change the chemistry of the immediately adjacent tissues from the normal alkaline state to an acid state, thus producing what might be called a localized acidosis, and as the disease progresses this battle of acids and alkalies goes on until in the terminal stages we find the tide running fast in the direction of the acid state. It is then allowable to act upon the hypothetical assumption that this bacilli, with its marked fatty acid structure, is capable of producing in tissues it infects a localized acid state, and that the organism does deposit calcium in these lesions for the purpose, not as has been thought heretofore, of walling off and calcifying these areas primarily, but attempts to concentrate there an excessive amount of alkaline substances for the purpose of counteracting the effect of the acids of this bacilli upon surrounding tissues. Therefore, if these deductions seem rational, it would be supposed that supplying the system with an abundance of calcium, the tissue salt which for some peculiar reason nature chooses to use, we would be aiding in the production of a chemical state, which is inimical to the environment of the tubercle bacillus. So, for the reasons outlined above, these forms of treatment have been conjoined, believing that the one would favor the action of the other.

This work will be pursued with every painstaking precaution that observations may be accurate and dependable in order that it may be known definitely whether derivatives of chaulmoogra oil are applicable alike in the treatment of leprosy and tuberculosis.

In closing, I would be unappreciative if I did not offer my thanks to Mr. A. D. Thorburn for his valuable aid in preparing for me the ethyl esters of chaulmoogra oil.

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- 427 BANKERS' TRUST BUILDING.

Postoperative Treatment of Abdominal Cases.

—E. R. Flint (*Practitioner*, April, 1921) says that the wound should never give any trouble; if it does, it is the surgeon's fault and not the patient's. Starving and purging before operation are physiologically unsound, and contribute largely to the discomforts after operation. This is especially applicable to flatulence. For a comfortable convalescence, it is essential that at the operation the surgeon should use his hands lightly and intelligently, so that handling is reduced to a minimum; that the body fluids should be reduced as little as possible by the avoidance of drying and the arrest of bleeding even from the tiniest point; that infection from without or within should be rigorously excluded; and that the anesthetic should be unaccompanied by frothiness. After operation the sitting posture should be encouraged, and the patient turned about freely; the passage of flatus should be assisted, fluid should be given freely from the first, and aperients avoided as far as possible. Lastly, it is undoubtedly possible to render the postoperative time one of complete comfort to many patients, and it should be one's ideal to attain this end in all cases, and no means to that end should be left out of the technique.

Vesicosigmoidal Fistulæ.—George Douglas Sutton (*Surgery, Gynecology and Obstetrics*, April, 1921) presents the following conclusions. 1. Bladder mucosa may be normal in the presence of a vesicosigmoidal fistula. 2. Vesicosigmoidal fistulæ are far more commonly the result of infective or inflammatory causes than the result of malignancy; probably the most frequent cause is inflammatory disease of the uterine adnexa and next in frequency is sigmoidal diverticulitis. 3. Stricture or stenosis of the rectum or the sigmoid below the fistulous opening tends to increase the size of the fistula; it may also be one of the factors in the development of acquired diverticula of the sigmoid. 4. Mild cystitis or local areas of cystitis around a fistulous opening with intervening normal bladder mucosa are common symptoms. 5. The symptoms from vesicosigmoidal fistula existed in the majority of the thirty-four patients for a year or more prior to operation. Two had symptoms for ten years with only mild diffuse cystitis, while those with marked cystitis had had symptoms for about a year. 6. As-

ending ureteropyelonephritis is not usually associated with vesicosigmoidal fistulæ. 7. Vesicosigmoidal fistulæ may heal spontaneously, if of infective or inflammatory origin. 8. Subsequent to an operation for vesicosigmoidal fistula due to a diverticulitis of the sigmoid, a new, acquired diverticulum may form in which a diverticulitis may develop and produce a second vesicosigmoidal fistula. Such a predisposition to the development of acquired diverticula and their ultimate results may be overcome by a resection of the sigmoid of the Mikulicz type in which tissue of suspicious cancerous appearance is also removed. 9. A large rectal tube is a very useful aid in the closure of the sigmoid; it should be passed up beyond the closure and thus relieve an unnecessary strain that might be exerted upon the anastomosis. 10. Operative results show cure in sixty-seven and sixty-four one hundredths per cent. of the patients and improvement in seventeen and sixty-four one hundredths per cent. more. Contrary to the opinion frequently expressed, the operative results in the presence of local tuberculous infection were good. 11. In thirty-two and thirty-five one hundredths per cent. of the patients cured of vesical fistula a fecal fistula remained which gradually healed within fifteen days to three years and three months, and in only two of these cases was there a frank recurrence of all the symptoms which were cured or improved at the second operation. 12. The operative mortality is low (eleven and seventy-six one hundredths per cent.) 13. Any reasonable attempt to improve the condition of these patients is advisable.

Iodine in the Treatment of New, Unfamiliar Infections.—Boudreau (*Journal de médecine de Bordeaux*, March 10, 1921) protests against the tendency of the practitioner to consider himself helpless, because no specific agent is yet known, in the presence of unfamiliar infections, such as epidemic encephalitis, hiccough, or influenza. A general, useful treatment for such infections is available in the administration of iodine—not as an iodide but in pure form. There has been sufficient clinical experience with iodine in tuberculosis, typhoid, typhus, cholera, influenza, pertussis, plague, leprosy, trypanosomiasis, malaria, and rheumatic and pseudorheumatic disorders to warrant recommendation of iodine as a general remedy against infection. The mode of administration should be adjusted to the disease. In slowly progressive disturbances, one should begin with small doses and increase them very gradually, finally reaching whatever dose may be necessary for proper results. In acute diseases with immediate danger to life, large amounts must be given from the start to insure prompt effects, and such amounts are far more harmless than is generally thought. In cases of intermediate severity the author gives ten drops of the French official iodine tincture every hour in a cup of some beverage, preferably milk. Even where good effects promptly appear, the dose should only be gradually reduced, as it is well to maintain the action as long as possible where the drug is well borne. If the disorder does not appear to be yielding and either fever or hypothermia persists, the

dose should be unhesitatingly increased to twelve, fifteen, or even twenty or thirty drops of the tincture an hour. Some patients have even taken a small teaspoonful of tincture in milk at the start without any difficulty. In a severe case of encephalitis the patient was brought in a few days up to daily doses of 300 drops, which were taken without difficulty; improvement in all the symptoms was observed as the size of the dose was increased. Coffee and chocolate are also good vehicles, or may be added to the milk. In the influenza epidemic, apparently doomed patients are asserted by the author to have been saved and quickly improved by iodine treatment. Iodine greatly shortens convalescence from any sort of infection.

Pericardiotomy for Suppurative Pericarditis.—Eugene H. Pool (*Annals of Surgery*, April, 1921) concludes that the method described (resection of portions of the seventh, sixth, and fifth cartilages) meets the most important indications—namely, it opens the pericardium at its lower part; involves little risk of injury to the pleura; provides ample drainage, and allows such exploration as is necessary both at the time of operation and during the postoperative course. If the condition of the patient warrants it, the author believes that this method is advisable, especially if a brief general anesthetic can be tolerated. In some cases, a less extensive exposure may seem imperative. Under these conditions resection of the sixth and seventh cartilages seems best. The procedure was employed in the case here reported and gave quite satisfactory exposure and provided efficient drainage. In conjunction with the Carrel-Dakin method it probably would prove adequate for many cases. Resection of the sixth cartilage alone may be done readily under local anesthesia and is tempting by reason of its simplicity, but the drainage is not satisfactory. The Carrel-Dakin method appears well adapted to the postoperative treatment of suppurative pericarditis.

Typhoid and Paratyphoid Fevers.—Alexander J. Wilson (*Glasgow Medical Journal*, April, 1921) says that in mild cases no special treatment is necessary or advisable. Fresh milk is the safest food. It should be citrated or diluted with lime-water and its proper digestion determined by an examination of the feces. If it is not digested it should be replaced by malted milk, or peptonized milk or whey. Weak tea, chicken broth, and meat extracts can be given in most cases. Beef tea and hough soup are very useful in the absence of diarrhea. A three grain dose of calomel every second night prevents stagnation of fermenting material in the ileum, and has an antiseptic effect. An enema should be given six or seven hours after the dose. Special symptoms may require treatment. Tympanitis should be treated by fomentations and turpentine enemata; constipation by simple enemata every second day; hemorrhages by turpentine internally, and sips of cold water. A hypodermic of morphine is very useful, also calcium lactate given internally in ten grain doses. In perforation the only treatment likely to be successful is laparotomy performed as soon as possible. Excessive diarrhea may be treated by small doses of opium combined with kino and catechu.

Starch enemata and laudanum are valuable. The milk should be boiled and well diluted with lime water. I have found mistura bismuth pepsin compound very useful, but the objection to bismuth is that it obscures traces of blood which may give valuable hints of a possible hemorrhage. Cholecystitis should be treated by urotropine, and when chronic by antityphoid inoculation, and, of course, surgical treatment may be necessary. Hyperpyrexia may be treated by tepid, cool, or even iced sponging, or by immersion in baths of a temperature between 75° to 85° F. For the delirium sedatives are required, and lumbar puncture has been performed to relieve intracranial pressure. A hypodermic injection of morphine one fourth grain, atropine one hundred twentieth grain, and hyoscine one hundredth grain is most useful in cases of violent delirium. Many other complications may arise which require treatment, especially pneumonia, failing heart, or phlebitis, and an important point is the treatment during convalescence of the acute carrier. The acute carrier should be treated by antityphoid inoculation, and urotropine should be administered, for this drug in addition to its action on the kidney is excreted during twenty-four hours by the liver cells and by those of the gallbladder. According to Castellani a dose of fifteen grains a day is sufficient to destroy the bacillus typhosus in a gallbladder in ten days, but experience proves that the complete cure of carriers is usually a difficult matter. Vaccine treatment has been extensively tried as a routine in enteric fevers with such varying results that the method cannot be said to be on a sure footing.

Instruments for Joint Range.—W. H. Robinson (*Journal of Orthopedic Surgery*, February, 1921) states that while the careful methodical measurement of the amplitude or range of motion of joints offers an opportunity to obtain valuable clinical data, it is even more valuable to record the progress toward complete recovery of certain types of joint disability. Taken in connection with measurement of muscle power the usefulness of the procedure is, in certain cases, increased. A simple type of instrument should be used. It is not possible in the ordinary hospital to have a mensuration department and therefore the more cumbersome instruments are not recommended. As all bones move from the joint on an arc of a circle we may accept measurements reading in degrees as recorded on the ordinary quadrant or protractor scale, but it would seem most desirable that all observers use the same method of taking and recording their measurements, and this necessitates the use of a constant base line for each joint, and that the angle be taken in relation to this base line. Doubtless no better base line can be found than the long axis of the proximal bone member of the joint under observation. For the shoulder and hip we use a line parallel to the long axis of the body and stopping at the anterior end of the axis of the motion. For rotation of the humerus and femur we use a vertical, in the first at the flexed (ninety degrees) elbow and in the second at the sole of the foot. For supination and pronation the most convenient base line is a horizontal line across the closed fist with the hand in full supination.

Cysticocholedochostomy.—Mont R. Reid (*Annals of Surgery*, April, 1921) states that prolonged leakage of bile is distressing in its consequences to those who withstand it and has occasionally, both directly and indirectly, been responsible for the death of the patient. The incision into the common duct should be closed and the tension on the suture line be relieved by a tube passed through the cystic duct. This tube, if properly fitted, may function for weeks, conveying the bile, without peritubal leakage, to the surface. On removal of the tube the discharge of bile through the fistula ceases either immediately or within a day or two, provided the common duct is not obstructed. The patency of the duct may and should be tested by clamping the tube.

Gibson-Mikulicz Tampon in Acute Appendicitis.—Charles E. Farr (*Annals of Surgery*, April, 1921) asserts that we have no comparative statistics to offer that would be of any value, but we are quite sure from careful observation over a period of years and a considerable series of cases, that the Gibson tampon does lessen mortality in the very severe type of cases. We feel also that it lessens morbidity and suffering and that the number of postoperative hernias is no greater than in other forms of treatment, that the hospital stay is no longer, that the conditions of the wound and the intraperitoneal conditions are better than by any other form of drainage. If these things are true, the tampon, as improved by Gibson, is a real step in advance in the treatment of appendicitis.

Treatment of Recent Empyema.—Frank S. Mathews (*Annals of Surgery*, June, 1921) concludes that: The percentage of recoveries in empyema will be increased by more frequent resort to aspiration. A wide thoracotomy will not delay but hasten healing by favoring the early lung expansion. Valve action at the wound is essential to healing. Fear of irrigation of small cavities should be abandoned. Delay in obliteration of a small cavity may depend on contained air. Measurement of cavities from time to time is desirable as a measure of progress in treatment. The walls of a cavity may be approximated by replacing air by liquid, on the escape of which the cavity is left empty, i. e., with walls in contact. Interest, experience, and painstaking are desirable at every stage in the management of empyema. Operation is a very small part of it.

Treatment of Leg Ulcer.—Louis Carp (*American Journal of Surgery*, June, 1921) says that a wholehearted interest should be taken in the treatment of leg ulcer. After etiological factors have been removed as far as possible, the great problem of infection must be dealt with. There are two vicious cycles regarding infection; first, reinfection from the skin, and second, reinfection from the deep structures. An ulcer cannot be sterilized all at once by a powerful antiseptic. Under such a condition, tissue is killed, and then a favorable medium for growth of bacteria is produced. A slowly acting antiseptic, such as chlorazene paste, would seem to be more nearly the ideal. To promote epithelization, ointments and mechanical factors must be used but not abused. Finally, plea is made for even a modest allotment of hospital beds for leg ulcer patients.

Transient and Paroxysmal Auricular Fibrillation.—V. R. Mason (*Bulletin of the Johns Hopkins Hospital*, May, 1920) describes eighteen cases of auricular fibrillation occurring in 258 medical admissions. In about seven per cent. of the total number of cases the arrhythmia was transient or paroxysmal. Over two thirds of the patients were in the sixth decade, and cardiac disease as evidenced by symptoms of myocardial weakness was a nearly constant finding.

Hydrotherapy in Tachycardiac Neuroses.—R. Dubois (*Presse médicale*, March 19, 1921) reports three cases, in two of which the patients exhibited continuous tachycardia and in one a typical paroxysmal tachycardia, all of which were markedly improved by cold water therapy. In the third patient the attacks of tachycardia disappeared for four years, and when he was treated again later, they were reduced to two in a year.

Some Limitations of the Flotation Method of Fecal Examination.—J. Daley McDonald (*Journal of Laboratory and Clinical Medicine*, March, 1920) states that while the brine flotation loop method has many advantages over other methods in the saving of time and materials and in the ease of manipulation, its range of usefulness is limited by the type of ovum. It was impossible by this method to detect infections with *Clonorchis* and *Fasciola*, and doubt is thrown on its effectiveness in detecting any operculated ova.

Personal Experience in Sclerocorneal Trephining.—Frank A. Morrison (*Indianapolis Medical Journal*, April, 1921) says that he has not obtained the slightest benefit from this operation in any case of simple glaucoma that had not a tension of at least fifty, as measured by the McLean tonometer. In a second class of cases where an intermittent high tension existed, probably thirty per cent. of the patients have been benefited, while in a third class, with tension constantly over fifty, marked benefit has been secured by fully eighty per cent.

Submucous Resection of Nasal Septum.—W. Meddaugh Dunning (*American Journal of Surgery*, October, 1920) states that the advantage of the submucous operation over other operations for deflection are:

1. That no mucous membrane has been destroyed.
2. That spurs and deflections have been entirely removed with the thickening of the septum.
3. That the ridge of cartilage which is wedged in between the lateral cartilage has not been interfered with, and there is absolutely no danger of a falling or saddleback nose.

Experience with Bacterial Vaccines in the Pneumonias.—Gustav Goldman (*American Medicine*, March, 1921) since the epidemic of 1918 has treated one hundred and thirty cases of lobar pneumonia with six deaths, and one hundred and eighty-seven cases of bronchopneumonia with five deaths. The vaccine used contained the influenza bacillus, the pneumococcus, the micrococcus catarrhalis, the staphylococcus aureus and albus. In a large percentage of cases of lobar pneumonia, the crisis occurred on the fifth day, and was rarely as late as the seventh day.

Letters to the Editors.

CRITICISM

NEW YORK, August 30, 1921.

To the Editors:

I hope you will have the courage to print this letter in spite of the fact that it constitutes an arraignment of your journal.

Being especially interested in tuberculosis I shall not attempt to judge the quality of the papers appearing in your publication on other subjects. In your January 4, 1919, issue you published a paper by the writer entitled "Fads and Fancies about Pulmonary Tuberculosis," a criticism of Dr. Gluck's paper on "The Real Value of Fresh Air in Tuberculosis and Many Infectious Diseases." Since that time I have noted other papers by faddists and worse in your journal. I recall one in which the author cured, I believe, about eighty per cent. of advanced cases of tuberculosis by diathermy.

A paper by G. Lenox Curtis (*The Etiology and Elimination of Tuberculosis*, NEW YORK MEDICAL JOURNAL, July 20, 1921, p. 114), which I have only just now had the opportunity of reading, has completely disgusted me. The paper I refer to is a gem for an antivaccination, osteopathic, chiropractic, or some other pamphlet advertising fake tuberculosis cures and nostrums of other kinds. Are you aware of the kind of stuff you are laying before reputable, intelligent physicians, or do you print anything that comes along in the mail without even looking at it? Permit me to quote a few of the passages which support my contention.

"The facilities of the great clinics of Berlin and Vienna where I discovered the etiology of tuberculosis in 1890."

"In the second, the incipient stage . . . tenderness of the spinal accessory nerve, due to luxation of the vertebræ, especially dorsal or cervical vertebræ, . . . meningitis (which can be detected only with the ozone electrode). . . . The fourth stage shows many displacements of the spinal vertebræ. . . . The one thing that is persistently present is subluxation of the spinal column, which is not confined to tuberculosis but is often found in most chronic diseases and is often the direct cause of the same. The cause is tertiary syphilis and is usually contracted through vaccination against smallpox, hence the white plague."

In describing a case of fifth stage tuberculosis (?): "She lived fourteen years and died following apoplexy. Vaccination and a half inch displacement of the atlas of the spine were the direct causes of her trouble. The vertebra was so completely anchored in the false position that it resisted all efforts to replace it."

In the "more than seven hundred cases of tuberculosis, the majority of which were in the fourth or fifth stages. . . . Antisyphilitic treatment was employed in most of the cases, but in the first and second stages the patient will recover without it, provided they can have ozone treatment. . . . Patients in the second stage should have acid treatment, avoid milk and eggs, *tuberculous meats*. . . .

The method of putting tuberculous patients to bed without an opportunity for physical exercise or outdoor life is strongly to be condemned. Tuberculous patients properly treated usually get well within four months on intravenous injections of salvarsan, one injection followed by red oxide of mercury . . . ozone once to three times a day over the entire body, but especially the spine, lungs, and head. . . . Acidulate the system rapidly and maintain this condition throughout the treatment. . . . Inhalations by atomizer, several times daily of equal parts of lactic, acetic, and aromatic sulphuric acids, one to four drams, sufficiently diluted, assist greatly in acidulating the blood and in preventing hemorrhage. It also dissolves the mucus and pus, and kills the tubercle bacilli and other bacteria which obstruct the breathing, and facilitates expectoration. . . . If there is a hemorrhagic tendency, give erigeron oil in small doses two or three times daily, or turpentine or nutmeg and inhale spray of the acid solution. From the first treatment by ozone, clinical signs of improvement are observed, and in six weeks, with daily or thrice daily ozonizations of the body, patients in the incipient stages apparently recover, while the consolidated lungs of those in the third stage are usually opened, the bacilli cleared, and the patient dismissed as cured in four months. . . . Those in the fourth and fifth stages require a longer time (The fifth stage of tuberculosis, according to Dr. Curtis, is characterized by 'frequently tuberculosis of the bowels, pus filled cavities in the lungs, liver, and kidneys, empyema, profuse night sweats, gangrene of the lungs, extreme emaciation, inability to take or retain food or water, respiration from 48 to 60 a minute, parts of the lungs not consolidated filled with râles, daily temperature up to 105 or 106, pulse from 150 to 300, and death hourly expected.') but ninety-four per cent. of the patients are usually well by the fourth month. . . ."

Equally exquisite is the author's contention "that syphilis is the cause of cancer," and that the "eminent pathologist," Dr. Abrams, agreed with him that "the indirect etiology of tuberculosis was the same as that of cancer." "However, he was willing to be convinced and immediately called to his laboratory several cases of tuberculosis then under treatment and applied his *electronic reactions method for syphilis*, finding it present in all of the cases." He also cites "findings of this eminent pathologist as further verification of my assertion that vaccine as employed against smallpox contains syphilis and is the primary cause of the white plague and that syphilis is the primary lesion that allows the development of tuberculosis."

One must read the article to appreciate the humor and the shame of finding it in a medical journal. I don't know whether extracts of this paper have appeared in some of the daily papers. If so, what a treat for all the "antis," the "pathies," and the "practics" that are increasing as rapidly as religious cults to fleece the dear gullible public. Has the NEW YORK MEDICAL JOURNAL gone over to their camp?

H. SCHWARTZ, M.D.

[Editorial comment on this letter appears in this issue, p. 362.—EDITORS.]

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NEW YORK, WEDNESDAY, SEPTEMBER 21, 1921.

Miscellany.

Urticaria Due to Fatigue.—E. Joltrain (*Bulletins et mémoires de la Société médicales des hôpitaux de Paris*, March 17, 1921) states that urticaria is one of the commonest manifestations of loss of colloid equilibrium—a process termed colloidoclasia by Widal, Abrami, and Brissaud. Usually it results from the ingestion of foreign substances, and occasionally from exposure to cold, as exemplified in cases of paroxysmal hemoglobinuria. In the author's case fatigue and exertion were obviously the chief factor in the urticaria. The patient was a woman aged thirty-two years, who had had attacks of urticaria two or three times a week ever since the age of twelve. Itching was such as to lead to ulcerations from scratching, and the body was covered with pigmented scars. The patient had always been considered as having bowel trouble, with obstinate constipation, occasional attacks of diarrhea, slow digestion, a sensation of weight after meals, sometimes nausea, and rarely vomiting. Fluoroscopic examination showed the transverse colon folded down toward the cecum and adherent in the appendiceal region. The patient at various times had suffered from rather severe pain in the iliac fossa. Ingestion of chocolate and eggs sometimes brought on urticaria, but dieting and digestive treatments had always failed to relieve the condition. It was found that the patient could never climb a hill, run, or attempt any outdoor game such as tennis or golf without the development of urticaria. A test walk of half an hour, with the bowel empty and nothing eaten for a day, resulted in hemoclastic blood changes within five minutes, followed by patches of urticaria over the thighs, arms, and chest. The entire body, particularly the face, became covered with an intensely red scarlatinoid erythema. Dyspnea and high fever—39° C.—were also noted,

and the itching persisted until the following morning, resulting in abrasions, nearly all infected with the staphylococcus albus. Repeated similar tests yielded like results. Raising the arms twenty times with a five hundred gram weight in each hand, while the patient was in bed, produced the same results. Exposure to cold or warmth failed to bring on urticaria. Nicolle observed an autoprecipitation in the patient's serum just before the appearance of urticaria. The phenomena of hemoclasia due to fatigue consisted in leucopenia, disturbance of coagulation, and lowered blood pressure. As the temperature rose, a considerable amount of albumin appeared in the urine, and the refractometric index of the serum was lowered. The condition met with in this patient is described as an autocolloidoclasia, as against the heterocolloidoclasia that occurs where urticaria is due to introduction of foreign proteins into the body.

Duration of Constriction of Bloodvessels by Epinephrine.—Meltzer and Auer (*Journal of Pharmacology and Experimental Therapeutics*, April, 1921) found that subcutaneous injection of epinephrine in the ear of a rabbit causes a constriction of all the vessels of that ear. The constriction is intense, but the outstanding feature is its very considerable duration—between three and eight hours. The rise of blood pressure from an intravascular injection of epinephrine, on the other hand, lasts at most seven minutes. The latent period between the time of injection and onset of constriction is the longer the further away the injection is made from the central artery. Injections made near to the central artery and on both sides of it cause practically an immediate paling of the entire ear and constriction of the central artery, with all its branches, and of the veins. The epinephrine apparently reaches the muscular sheath through the adventitia and not from the lumen of the bloodvessels.

Etiological Relationship Between Lethargic Encephalitis and Epidemic Hiccough.—G. Lemoine (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, March 17, 1921) notes that observations in various localities have led to the supposition that epidemic hiccough is merely an attenuated form of lethargic encephalitis. A recent case of this affords unusually striking evidence in favor of this view. A boy who was in a boarding school in Belgium developed epidemic hiccough, from which he recovered in three days. On the following day he returned home for his Christmas vacation and was in constant contact with his brother for five days. The brother then was seized with malaise and fever, followed by persistent strabismus, diplopia, ptosis, marked somnolence, and exaggerated reflexes, with absence of Kernig's sign. The case was treated promptly by a fixation abscess and the injection of five mils of blood serum from the brother who had had hiccough. The abscess was opened on the seventh day, yielded a free flow of pus and was kept open by a drain. The temperature dropped abruptly to normal and all the local and general symptoms began to improve, recovery following. Lemoine has treated six cases of encephalitis by prompt institution of a fixation abscess, and none of these cases succumbed to the disease.

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WHOLE No. 2218.

The Etiology and Treatment of Eclampsia*

By BARTON COOKE HIRST, M. D.
Philadelphia.

If one would envelop himself in a mental fog he should read the literature of the etiology of eclampsia. One of my staff, wishing to write a paper on the subject, appealed to the professor of pathology for advice. He was told to begin his paper with the statement that nobody knew anything about the etiology of eclampsia and then to amplify that text as much as he chose.

First came the albuminuric and nephritic theory, followed by the toxemic doctrine, and then too many theories more or less visionary to record in their totality. There was the giant cell embolism in the lungs, of Schmorl; the bacillary theory of Gerdes, cruelly exposed by German critics, who at once identified the specific microorganism as the *Bacillus prodigiosus*; Sellheim's remarkable notion that the origin of the disease was to be found in the breasts and that their amputation was the proper cure. Then a deficiency somewhere in the chain of ductless glands was advanced as an explanation, not to mention the commonly accepted fact that a deficient functional activity of liver and kidneys allowed an accumulation of toxins in the blood which acted directly on the cortex of the brain producing the convulsions, affected the epithelium of the kidneys causing an acute parenchymatous nephritis, and destroyed the liver cells, with a resulting hepatic degeneration like that of chloroform or phosphorus poisoning.

The origin of these toxins is admittedly either the fetal body, the placenta, or both; but there is no agreement yet as to which of these sources the production of the toxins is to be credited. Some recent experimental work throws a little additional light on the subject. It has been demonstrated that the placenta has the power to convert certain products of metabolism into urea, thus rendering them fit for excretion.

It was asserted some years ago by Italian investigators that there was an analogy between the tetany following removal of the parathyroids and eclampsia, and the extract of these glands was recommended for the treatment of the disease. I tried it for a time but could not observe any benefit

from it. Recently this line of thought has been revived.

It has been demonstrated that if hypoparathyroidism is produced by partial removal of the glands in dogs the animals show no tetanic tendency if fed upon bread and milk, but if given meat convulsions develop. From this it is argued that the parathyroids either themselves are active in reducing products of metabolism to excretable substances or else that they activate the liver in this function; that a failure to reduce these substances evidences either a deficient action of the parathyroids or that an excessive task thrown upon them results in a breakdown and a failure to function. Anyone who has given this matter long and careful attention must arrive at some conclusion of his own, however erroneous it may be. I venture, therefore, to express my belief as to the etiology of eclampsia.

ETIOLOGY OF ECLAMPSIA.

I believe that the origin of the toxins of eclampsia is mainly in the fetal body; to a less degree in the placenta. Every living cell must get rid of some of the products of its life activity or it perishes. The vast aggregation of cells in the fetal body has no way of eliminating these products except by emptying them into the maternal blood. The fetus lacks perspiration, respiration, defecation and urination. The placental cells also must get rid of their waste products. These also are thrown into the maternal blood. The process of conversion into excretable substances begins in the placenta, but only to a moderate extent; the process is continued by the maternal liver and probably to a less but an important extent by the endocrine system. Finally all the excretory organs of the body eliminate the substances thus reduced to excretable form, the principal rôle being played by the kidneys, but the lungs, the skin and the bowels play their part. The adult body has enough to do to take care of the incineration, oxidation, and elimination of the products of its life processes; when the waste products of the fetus and the placenta must also be taken care of, it is no wonder that overburdened organs break down; which is all the more likely if a heavy proteid diet, an inactive skin, and sluggish bowels increase the work they have to do.

*Read before the King's County Medical Society and the Brooklyn Gynecological Society, April 19, 1921.

Hence the success in avoiding toxemia by a diet light in proteids, by preserving normal skin action, by regulating the bowels and stimulating the liver at stated intervals of about every four weeks by a mild course of calomel and soda followed by a light saline laxative. This preventive treatment minimizes to the utmost the incidence of eclampsia in the private patients under our immediate observation and control.

TREATMENT OF ECLAMPSIA.

The second part of my subject, the treatment of eclampsia, is much easier to deal with than the etiology. It will be admitted, I think, that there are four therapeutic principles to be considered, if one accepts the etiological theory just advanced, namely, elimination, the sedative treatment, measures to reduce blood pressure, and if the patient is not yet delivered, the operative treatment. I am not a fanatical adherent of any of these principles but employ them all as follows:

Elimination.—It has been contended that elimination is not scientific because it has not been demonstrated that the toxins of eclampsia are eliminable by the only agents at our command, the skin and the bowels, the kidneys being temporarily out of commission. But this objection ignores the fact that in every case of eclampsia the patient has an acute parenchymatous nephritis and is uremic as well as toxic from the original cause of the nephritis. We employ diaphoresis and catharsis, therefore, energetically, sweating the patient in a sweat cabinet every four hours for thirty minutes and supplying the subtracted fluid by proctoclysis—a quart of water with an ounce of bicarbonate of soda (to combat acidosis) by the drop method midway between the sweats. I have no experience with the method proposed by Dr. H. J. Davidson, of Seattle, of filling the stomach through a stomach tube with large quantities of water, one thousand to fifteen hundred cubic centimetres at regular intervals. I tried it once but got alarming symptoms of acute dilatation of the stomach and cardiac embarrassment. I think, however, it should be tested more thoroughly.

In common with most physicians I always begin the treatment of eclampsia by washing out the stomach to remove undigested food, and use the stomach pump to instil a purgative. I have been in the habit of using two ounces of castor oil with two drops of croton oil. If the patient is able to swallow, this is supplemented by repeated doses of concentrated epsom salts solution every half hour until two ounces are taken. If the stomach pump is not used for any reason, a quarter of a grain of elaterium on the back of the tongue replaces the castor oil, and if there is much edema, twenty grains of compound jalap powder is administered. Directly after the gastric lavage the colon is also washed out to remove fecal masses which might add their quota to the general toxemia and to prepare the rectum for the proctoclysis.

Sedative treatment.—Anesthetics are not used; morphine alone is depended upon, but is only administered if the convulsions are violent and frequent. It seems injudicious to give morphine to a comatose patient in whom convulsions occur only at long

intervals. I confess I cannot understand the 8.9 per cent. mortality in 829 cases quoted by the advocates of the Stroganoff treatment. I am sure I could not obtain such results by this treatment alone and I do not know of any of my colleagues in this country who do.

Measures to reduce blood pressure.—These must have a place in the treatment of eclampsia, for the mere excess of systolic pressure may be a cause of the multiple apoplexies in many organs which are often found postmortem. We find the following means most efficacious: An initial dose of ten minims of veratrum viride and the subsequent administration of one hundredth of a grain of nitroglycerine every four hours. Venesection is done routinely to the extent of sixteen ounces if the systolic pressure is at or above 180. Sweating is almost always followed by a decided depression of systolic pressure and is therefore doubly useful. If the woman is not delivered, puncture of the membranes brings the blood pressure down in the most remarkable manner. I have seen it fall one hundred points in three minutes, from 236 to 136. Diastolic pressure should be carefully observed. If the pulse pressure is low the energy of the treatment should be diminished; it may be necessary to drop all treatment of eclampsia and to substitute stimulation for it temporarily.

The operative treatment of undelivered women.—This is a matter of great interest. It seems logical; the woman is eclamptic because she has a fetus in utero; clinicians often see convulsions cease when the woman is delivered. Acting on this apparently logical idea I adopted the immediate operative treatment three separate times but the mortality always rose; and my experience is not unique. Dr. Reuben Peterson's collection of more than one thousand cases, although made to support an argument for this procedure, showed a mortality of about twenty-five per cent. I now reserve the operative treatment by Cæsarean section for those cases in which there have been preliminary elimination, sedative treatment, measures to reduce blood pressure, without progress in labor and without improvement. Although reserved for the worst cases, therefore, with preliminary treatment as described, Cæsarean section has given surprisingly good results.

SUMMARY.

During the last five years in the University Maternity Hospital we have had eighty-nine cases of eclampsia as follows:

Maternal mortality, 21.3 per cent.; mortality in postpartum cases, nineteen per cent.; mortality in antepartum cases, twenty-two per cent.; infant mortality, thirty-six per cent. There were fourteen Cæsarean sections; maternal mortality fourteen per cent., infant mortality thirty-four per cent. Anterior vaginal hysterotomy, which is no longer done, was performed in three cases; maternal mortality, thirty-three per cent.; infant mortality sixty-six per cent. Spontaneous or forceps delivery in thirty-seven cases; maternal mortality, nineteen per cent.; infant mortality, thirty-five per cent. Cured without delivery, five, or 5.6 per cent.

Once one begins to juggle with figures there is no end to the twists that may be given to statistics, but

this much may be said in explanation: Four patients died within an hour of admission. It is not unfair to omit them. This reduces the total mortality in eighty-five cases to fifteen per cent., comparing favorably with the twenty to twenty-five per cent. mortality that both DeLee and Williams declare must be expected, and with 28.3 per cent. in 251 cases in the Sloane Maternity Hospital in New York.

In the fourteen Cæsarean sections, two deaths occurred, one two weeks and the other three weeks after operation, one from staphylococemia and the

other from aspiration pneumonia. In neither of these cases was the operation responsible and in both the eclampsia had been cured, so that it would not be unfair to state that there were no deaths from eclampsia in the women subjected to Cæsarean section after preliminary treatment, although these fourteen patients had not responded to the ordinary treatment and were rapidly going from bad to worse. They were better prepared, however, to endure the operation by the preparatory treatment, especially the elimination.

1821 SPRUCE STREET.

Surgical Endothermy in Malignancy and Precancerous Conditions

By GEORGE A. WYETH, M. D.,
New York.

Endothermy, the production of heat in the tissues from within, is particularly applicable in the treatment of accessible malignancy and precancerous conditions.

It is generally accepted as true that any treatment of cancer which does not remove the last vestige of malignant cells is likely to accelerate the disease. With surgical endothermy, visible and palpable lesions of the skin and mucous membranes can be completely destroyed. So perfected is the technic that treatment may be applied with equal success to the cornea or to an epithelioma involving the greater part of the lip or tongue.

Treatment by endothermy is rapid and easy of application. Blood-vessels and lymphatic channels are sealed off before the malignant area is attacked, thereby greatly reducing the danger of metastasis and the likelihood of recurrence. The operation is thus bloodless and is practically unaccompanied by surgical shock. The immediate postoperative condition is gratifying to operator and patient alike, for the relief from suffering is generally prompt and there is little or no painful reaction. The wound heals rapidly and a good cosmetic result is another of the many advantages of this method.

Endothermy is not heat applied from without, as in cauterizing with the actual or cold cautery. It is not fulguration, as advocated by De Keating-

Hart. It does not burn, it does not char, but acts with a minimum of trauma. The heat is produced by the resistance of body tissue to high frequency electric currents varying in voltage and amperage, each current with its own adaptability to certain cases. Since electric currents heat the conductors through which they pass, it is impossible to raise the internal temperature of the body by the continuous or faradic currents. The pain of strong applications

would be too great. It is necessary, therefore, to employ currents which reverse their direction many thousands of times a second—the so-called high frequency currents.

Surgical endothermy comprises desiccation and coagulation. Desiccation, or dehydration, was devised by Dr. William L. Clark, of Philadelphia, who has also perfected the technic of treatment by coagulation, and it is to him that I am indebted for the methods I employ.

Desiccation is performed by the use of the Oudin or monopolar current, a current of high voltage and low amperage, and is used in

all work of lighter character, such as the destruction of malignancy of the vocal cords, papilloma, warts, moles, naevi, leucoplakia, vernal catarrh and milder skin epithelioma.

Coagulation is accomplished by means of the d'Arsonval or bipolar current of relatively low voltage and high amperage, which is more penetrating and more intense in action. Lesions of larger size

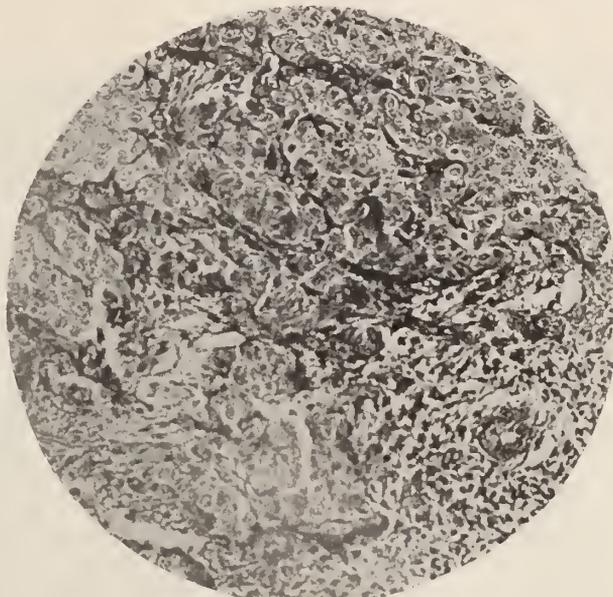


FIG. 1.—Section from floor of mouth showing nests of cells in prickle cell epithelioma of the floor of the mouth. (Case I.)

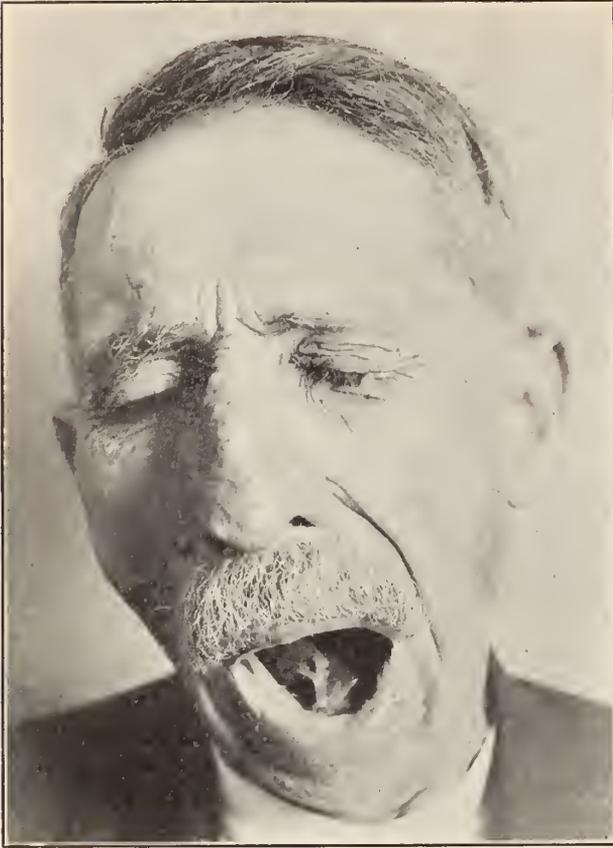


FIG. 2.—Rapid growing, prickle cell epithelioma of the floor of the mouth, showing marked areas of induration and craterlike ulceration. (Case 1.)



FIG. 3.—Same patient as in Fig. 2, after one treatment by coagulation, showing lesion completely healed and no clinical evidence of old trouble.



FIG. 4.—Basal cell epithelioma of four years' duration, patient seventy-seven years old.



FIG. 5.—Same patient as in Fig. 4, after one treatment by desiccation. Note the large, newly formed, pulsating blood vessel traversing the treated area.

and greater depth are destroyed by this current and it is particularly applicable to lesions of the lips, alveolus, tongue, floor of the mouth, palate, buccal surfaces, and more widespread skin involvement. One pole is applied by means of a well wet, indifferent electrode placed generally underneath the buttocks as the patient lies upon the table. The other pole is the active electrode which executes the work of destruction. This is done by an ordinary sewing or darning needle held in a suitable handle.

The lighter work is performed with local anesthesia. A general anesthetic, however, is necessary for the more extensive lesions. When ether is used the patient must be deeply narcotized for the time being and the ether removed during the actual use of the current. We are using a machine designed especially for this work by Dr. Clark. Its cost is relatively low when one compares it with the cost of an x ray outfit or of a usable quantity of radium and it is invaluable in many cases of malignancy which do not respond to treatment otherwise available.

The following is a typical case of rapid growing, prickle cell carcinoma of the floor of the mouth.

CASE I.—J. W., aged sixty-six, sailor, reported that about two months previously a pimple had appeared under his tongue. He thought that the dental plate was irritating his mouth, but was assured by his dentist that this was not the case. He paid scant attention to the matter thereafter, but while he was at sea the pimple began to grow. On returning to New York he went to Bellevue Hospital where "the doctor opened it and since then it has had a hole in it."

Examination showed an indurated mass the size of a small hen's egg involving the floor of the right mouth. It was foul and had a craterlike ulceration at right of frenum. It was painful and tender, but no palpable, cervical glandular enlargement could be

made out. Under ether narcosis the entire mass was completely surrounded or shut off by the coagulation needle. This walled off the whole malignant area, by a definite wall of coagulation necrosis, it being necessary to coagulate through the frenum, under surface of tongue and inner surface of right jaw in this case. A section for the microscope was then removed by the knife, after which the whole mass was coagulated or cooked *in situ*. The dead tissue was next removed by scissors and the entire cavity seared over with the current, thereby doubly protecting the operator against hemorrhage. The lingual artery was not ligated.

Patient returned to room in good condition. Next day there was considerable swelling of tongue and a profuse flow of saliva, but he was free from pain and was able to take liquid nourishment. He left the hospital on the third day in fairly good condition, although toxic absorption had rendered him very cachectic in appearance, with skin of a dark, yellowish hue, both of which cleared up rapidly.

Sloughing of the remaining necrotic tissues began shortly afterward and was complete in the third week, although a piece of bone sequestered from the inner surface of the jaw in the sixth week. Wound has completely healed, and patient has remained free from pain. Both sides of patient's neck were treated with deep penetrating x ray by Dr. Remer as a postoperative prophylactic measure.

As here illustrated this method would be justified as highly intelligent and humane if it carried no advantages except the definite alleviation of pain; but I am convinced that surgical endothermy, on account of its power to attack accessible lesions, can render operable many so-called inoperable cases, and that, with our radium needles and deep penetrating x ray, it is a trustworthy ally in the fight against malignancy.

167 WEST SEVENTY-FIRST STREET.

The Treatment of Carcinoma of the Cervix and Uterus by Radium Supplemented by Deep Roentgen Therapy*

By RUSSELL H. BOGGS, M.D.,
Pittsburgh, Pa.

Treatment of carcinoma of the cervix and uterus is still far from satisfactory. Really, the only progress made during the past twenty years is radiotherapy and operation by cautery. The cautery operation as performed by the late Dr. X. O. Werder and Dr. E. A. Weiss has been an exceedingly efficient method of removing the uterus without opening the lymphatics. There are not many more cases cured surgically at a certain stage of the disease than there were twenty years ago, except by the Wertheim operation which most American surgeons consider too radical, although earlier cases have been operated in successfully. The improvement in sur-

gical technic reduced the mortality, from an operative viewpoint, more than it increased the number of patients cured of cancer at the end of five years. Operations by the cold knife are certainly meeting with less favor each year, since we are able to accomplish so much by radiotherapy. Carcinoma of the cervix is still considered a surgical disease, but if the patient is to receive full benefit from all methods of treatment, it must be accomplished by the cooperation of a well trained surgeon and a well trained radiologist. Results are certainly not obtained by the man who has a few milligrams of radium, applies it locally, has only seen and treated a few cases, and, instead of deep therapy using both large quantities of radium and the x ray, gives

*Read before The Röntgen Ray Society of Central Pennsylvania, Pittsburgh, Pa., April 30, 1921.

superficial radiation. With all these methods employed, even in the early cases, we are not curing a sufficient number of patients at the end of five years.

The treatment of carcinoma at present consists, first in the radical operation by a surgeon who still thinks he can cure a large percentage of cases by the cutting method; second, by those gynecologists who remove the uterus and expect inefficient superficial therapy to cure their patient; third, there are a few gynecologists who consult with a qualified radiologist to determine the method of treatment; fourth, there are a large number of surgeons who will buy from twenty-five to fifty mg. of radium and believe they can treat cancer of the cervix and uterus intelligently without the assistance of deep x ray therapy from the outside; fifth, there are also a few röntgenologists who have put themselves in the same class by buying a small quantity of radium and giving superficial radiation instead of deep therapy and expect results. This shows us that it is difficult to draw conclusions from cases treated by radiation, because it is given in so many different ways, using from twenty-five mg. up to a gram, most of this being used carelessly and inadequately, and omitting, in most cases, deep röntgen therapy.

The brilliant results of radium in the treatment of carcinoma of the cervix and uterus are drawing many into this field without training, as may be expected, and, consequently, poor technic and judgment are bound to react; but fortunately there has been sufficient good work done that it will react more against the radiologist and gynecologist who have made a reputation than against radium. It is just as necessary to develop a radium technic as a surgical technic, and for some time to come the best end results are bound to be produced by those who have studied every detail, checked up by a large number of cases, and compared details and results with a large series of cases treated by others.

Until lately only the hopelessly inoperable and recurrent cases were referred for radium treatment, but now we are getting borderline and more favorable cases for treatment. Then we should be careful not to make enthusiastic and unwarranted statements. In any method of treatment of cancer, conservative statements and rather radical methods of treatment are advisable. Can a gynecologist give a prognosis from clinical history, pelvic examination, examination of tissues at the time of operation or a pathological report? No. Then, why should we make extravagant statements or promises in any given case from the use of radium and deep therapy?

Experience has taught that removing the local lesion is not the most important factor in the operable case, and that, in order to increase the number of cures, our efforts must be directed towards the involvement, often impalpable and invisible, of the lymphatic tissue throughout the lower part of the pelvis. Hysterectomy, with the most careful dissection and removal of the adjacent tissues, has been an effort in the right direction, although it is a procedure that carries a high primary mortality, and until recently has been the only method which offered any hope to these poor sufferers. Nevertheless, the five year period shows a discouragingly

low percentage alive, and from a microscopical point of view it must be admitted that even the boldest operator can hardly hope to remove all the lymphatic tissues about the base of the bladder, in the parametrium beyond the uterus or in the base of the uterosacral ligaments.

Most of those who have treated a large number of cases agree that the evidence indicates that radium destroys disease at a greater distance than the knife is capable of removing it, and does this with no risk or inconvenience to the patient. Investigations have shown that, in from thirty to fifty per cent. of operative cases of cancer of the uterine cervix, the disease has formed metastases into the pelvic nodes. Unfortunately, we are unable by any clinical test to determine whether or not there is an extension into the pelvic lymphatics. Therefore, the only safe way is to ray the pelvic glands in all cases, regardless of the stage of the disease. It has been shown there is no dependable relation between the size of the primary growth and the presence or absence of metastases. In about forty per cent. of inoperable carcinoma of the cervix the pelvic nodes are free from metastases. This would account for brilliant results in moderately advanced cases by radical hysterectomy and from local radium treatment with even inefficient radiation to the pelvic lymphatics, because even local radiation, properly given, appears to destroy cancer cells at a greater distance than can be removed by a single hysterectomy.

It has been stated in the different clinics that only about seven or eight per cent. of the patients coming for treatment are free from carcinoma of the cervix at the end of five years. This shows that the number of inoperable cases when first seen, together with the recurrences, makes it imperative that at least ninety per cent. of these cases should have the benefit of radium.

Uterine cancer, which arises in the fundus, grows slowly and usually does not extend beyond the uterus until late in the course of the disease. Operative mortality is low with a high percentage of cures. Cancer which arises from the cervix runs a more rapid course, early invading adjacent tissues. Hysterectomy for carcinoma of the cervix is attended with a higher mortality and a larger percentage of recurrences.

Cancer of the cervix is divided histologically into the squamous celled and the cylindrical celled, or adenocarcinoma. The squamous celled type is the most common; but the adenocarcinomas are most malignant, are usually situated in the cervical canal and are not diagnosed early. Antepoperative treatment is strongly advocated by many and should be employed in every operable case.

If we consider an operable case is one in which there is not extension of the cancer cells beyond the cervix, then three things will be accomplished by antepoperative treatment: destroying cells entirely, checking cell division, and the formation of productive inflammation to be followed by fibrosis. The first effect is obtained in from two to four weeks, but the fibrous formation will not take place until from four to eight weeks. During this time, in many cases of cancer of the cervix, there is a disappearance of cancer cells in the cervix and even to

considerable depth. It has been stated that this has been accomplished by actual cautery, but it should be remembered that radium will destroy cancer cells at a greater distance than heat. When radium is used as an anteoperative procedure the operation should be performed within from four to eight weeks before marked fibrous formation has taken place.

The results by the Wertheim operation in favorable cases correspond with statements which have been made by various authorities; that is, the early involvement of the parametrium or the lymphatics at the time of the operation, according to different observers, varies from thirty to sixty per cent. This would lead us to believe that only cases in which really no glandular involvement whatever has taken place, were cured by a Wertheim operation alone, and that proper radium treatment locally, supplemented by sufficient crossfiring from radium packs or the x ray from outside as an anteoperative procedure, would cure many more cases. Then we may ask the question, should those who do the most radical operation subject their patients to a high operative mortality without giving them all the benefit possible from radiation, or until a larger percentage of cures takes place than has ever been reported by the boldest operators? It is neither the occasional brilliant result nor the failures that count in work of this kind, but it is the correct analysis of all cases with full histories and a careful followup record that will give us the real value of this procedure.

TYPES OF CANCER.

Cancer of the cervix may be classified into four groups clinically, namely:

First, early cases where the growth or ulceration is limited to only a part of the cervix and does not extend into the vaginal walls. Even in these early cases recurrences take place and even metastases into the glands may have occurred before the operation.

Second, where the process is more advanced and the involvement, clinically, is still limited to the tissues of the uterus because the organ is freely movable. Cases of this class may include cauliflower growths, which protrude from the cervix and often fill the greater part of the vagina. Even in these cases the cancer cells may not have reached the pelvic lymphatics. This is a class of cases which will derive great benefit from anteoperative treatment, and by such procedure the end results should be better.

Third, where the disease is further advanced and the carcinoma extends into the vaginal wall. There is a slight fixation of the uterus, but, clinically, there is not extensive involvement of the broad ligaments. If there is no glandular involvement in these cases, which fact we can never determine clinically (but as stated the glands are often free in cases of this class), rather a high percentage may be clinically cured by radium treatment. Time alone will tell whether or not we should depend upon radium alone in these cases, even if we have obtained brilliant results by radium in a number of cases.

Fourth, cases of carcinoma of the cervix with marked fixation of the uterus, the disease extending into one or both broad ligaments with involvement

of the vaginal wall and a greater part of the cervix destroyed.

When one considers that about a third of the patients with cancer of the cervix that receive no treatment die within a year, and that a large percentage of the remainder die within two years from the first manifestation of the disease and very few live three years, it is apparent that the amount of palliation and prolongation of life from radium treatment, and the fact that many of them die of internal metastases without return of the local symptoms, means much to the patient. Today, radium is indicated as a palliative measure for hopelessly inoperable and recurrent cases, as an anteoperative procedure and for prophylaxis after surgical removal. Lately, radium is being used by some for primary cases of carcinoma of the cervix when the disease extends into the cervical canal, because nearly all of those cases are followed by a recurrence even in the early cases after operation. The malignant process in these cases will disappear rather promptly by radium.

Radium is a specific palliative in inoperable cancer of the cervix and uterus. It will clinically cure some of the cases, and subjective improvement is noticed in a certain percentage of others. However, recurrence takes place in many of these clinically cured cases within six months to three years. The patient during this time regains normal health and can lead a useful life. If a recurrence takes place, as a rule the patient suffers little in comparison with those who had no radium treatment. In these hopeless cases, the offensive discharge and hemorrhage usually completely disappear within from two to four weeks. The cessation of discharge, which often is so offensive to the family and even to the patient, is a remarkable feature in itself. The local condition changes in character within from two to four weeks after the treatment, the mass begins to contract and shrink and continues to decrease in size. This is more marked in some cases than others. The deodorizing and sterilizing effect of radium is remarkable in the inoperable or recurrent cases where there is a broken down mass of carcinomatous tissue or a craterlike sloughing extending into the broad ligaments. These cases have a discharge with a foul odor and manifest an irregular temperature. One application of radium will alleviate these symptoms and mean much to the patient. The radiotherapeutic treatment consists in the local application of radium in the cervix and the vagina, supplemented by either radium or the x ray from the outside or the combination of both. The local application of radium to the cervix is carried out by most operators on a sounder basis than treatment given from the outside.

In the last few years I have employed three thousand milligram hours in the vagina, using one and a half millimetres of brass and sufficient gauze and rubber to make fifteen millimetres of filtration. Three tubes were usually employed, one directed toward the cervix and one toward each broad ligament. These tubes were packed as far as possible from the rectovaginal wall, thereby lessening the danger of the fistula, and unless the uterus was fixed from disease, the organs were pushed higher up in the pelvis by the amount of packing used, thus giv-

ing more efficient treatment to deeper pelvic glands. Each half inch treated means the same as a more radical operation. The importance of this has been overlooked by many and is undoubtedly one of the causes of producing an unnecessary fistula. Involvement of the rectum is nearly always a late manifestation of the disease and the amount of radiation the rectovaginal wall receives is usually sufficient to destroy outlying cancer cells. The tissues of the cervix are relatively insensitive in comparison to other tissues of the body. It is always important to bear this in mind, but we must remember that there is always a limitation to the amount of radium that can be used. Whenever it was possible by any means to insert radium into the cervical canal it was always done, because cancer cells thereby can be reached which could not be from the tubes applied in the vagina. I have given three thousand milligram hours in the cervical canal, in addition to three thousand milligram hours in the vagina, making a total local dose of six thousand milligram hours.

METHODS FOR DEEP RAYING.

During the past year the Germans have claimed better results by using a large port of entry, and this has caused considerable discussion and investigation in regard to the best method of treating the deep metastatic glands. At present, four principal methods are employed in raying the deep pelvic glands in the treatment of carcinoma of the cervix and uterus. They are as follows:

First, by using heavy filtered x ray at a greater distance and using as large a port of entry as possible anteriorly over the abdomen, one large port of entry posteriorly over the sacrum and lower part of the back and two laterally. This is the Freiberg method, and they state that by using such large ports of entry the scattered radiation measured at a depth of ten cm. is from two to three times more than the direct radiation. This method

encounters many dangers and requires special equipment and technic to be carried out accurately, and certainly it should not be employed by the beginner. The patient is subjected to about seven hours' treatment in one day and the treatment is not to be repeated. The patients usually become nauseated and it is often necessary to transfuse following the treatment. At present, it is doubtful whether the American people will stand for such radical treatment.

Second, Seitz and Wintz at the Erlangen clinic have modified the Freiberg technic by using three areas six by eight cm. on the abdomen, three areas of the same size posteriorly over the sacrum and a seventh through the vulva. Their technic was about the same, except that they used less tube distance, which required less time to give a lethal or a cancericidal dose.

Third, the method ordinarily used in this country has been about the same as the technic described by Seitz and Wintz, except we use more ports of entry and do not attempt to give the entire surface area in less than a week, instead of a day.

Fourth, some in this country use large quantities of radium spread out on a square of not less than fifteen by fifteen cm. and place the radium pack at a distance of four cm. from the skin. Then, the scattered rays from radium are beneficial as well as the direct. Space would not permit to discuss these different methods in detail. All have the same object, that is, to give a lethal or cancericidal dose to all the glands which have metastasized.

However, it is true, that with all these variations, in the selection of radiation and the different methods of technic, many are producing about the same results because these radiotherapeutists know the proper dose, difference between the skin dose and depth dose and the difference between a lethal dose and an erythema dose, and know what should be expected in a given case presented for treatment.

EMPIRE BUILDING.

Prophylaxis in Carcinoma of the Cervix

By IRVING SMILEY, M. D.,

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At no time in the history of medicine has the subject of cancer been brought to the attention of not only the medical profession but also to that of the general public, as at present. In spite of every resource known to science, in spite of the great minds daily devoting their time and energy to this problem, in spite of vast sums of money expended by governments, individuals and scientific societies, we must confess that cancer today remains to the profession an unsolved problem.

As a matter of statistics it would seem that the incidence of malignancy is actually on the increase. Bland's statistics show that one woman out of every eight dies of cancer, and that thirty per cent. of all cases in females have their origin in the uterus. In 31,482 cases Welch found the uterus involved in twenty-nine and a half per cent. Studying the death

rate of cancer occurring in Philadelphia covering a period of twenty-five years, it was found that 9,777 women succumbed to this disease. Of this number 3,172 involved the uterus. The statistics for New York city show that in the year 1918 approximately 2,740 females died of cancer, in 1919 approximately 2,874, and in 1920 there were over three thousand deaths from this disease. Recalling Bland's and Welch's statistics, probably about one third of this number died of cancer of the uterus. Mayo's statistics are somewhat more favorable in that he finds that only one woman out of every eleven dies of cancer.

Peterson has made a careful study of five hundred cases with special reference to the age incidence. He found the following:

1. Eighty-two per cent. of all uterine cancers

occur between the ages of thirty-five and sixty-five.

2. The younger females are not immune, since seven out of the five hundred cases occurred between the ages of twenty and twenty-five. In these the cervix was involved in six. This predominance of the cervical location is significant and proves that the younger the patient, the more prone is the cervix to become the seat of the disease as opposed to adenocarcinoma of the fundus.

3. The greatest number of cancers of the cervix were found among patients of forty to forty-five years.

4. There were ninety-four cases of cancer of the fundus, or eighteen and eight tenths per cent., an unusually large number in this series. This percentage is much higher than that reported by other observers. Anderson and Platt found fifteen per cent. in 250 cases of uterine cancer. Koblanck's records show only four and four tenths per cent. in 6,354 cases. Kutner's records show nine and four tenths per cent., Hofmeier eleven per cent., Hammer thirteen per cent., Olshausen twelve per cent., Wilson eleven per cent., and Mayer, in a recent German publication, eighteen and eight tenths per cent. out of 830 cases.

Peterson draws the conclusion that it is fair to assume that of all uterine cancers ten to fifteen per cent. occur in the fundus, leaving eighty-five to ninety per cent. involving the cervix. Another interesting conclusion in this study is that a large proportion of the cervix cases, 369 in all, were squamous cell carcinoma, while only thirty-seven per cent. were of the adenocarcinoma type. Of the 369 cases of the squamous cell carcinoma, twenty-three and a half per cent. were found in patients under forty years of age, while fifty per cent. occurred between the ages of forty and fifty-five. In the thirty-seven cases of adenocarcinoma of the cervix, thirty per cent. occurred in women between twenty and forty years of age, the remainder occurring between the ages of forty and forty-five.

While Peterson's statistics show that there is a distinct cancer age, i. e., between thirty and sixty-five, it seems to me that it is of importance to remember that cancer may occur at any age in the life of a female. There is a case on record of a cancer of the cervix in a girl aged two and a half years, and Findlay has reported a case in a woman of ninety-three. The safest rule, to my mind, is to keep the possibility of cervical cancer constantly in view in every gynecological examination regardless of the age of the patient.

Nothing has been added to our knowledge of the cause of cancer in recent years. The entire subject centres about the factor of continuous irritation in any part of the body, more especially in the cervix. It is a clinical fact, as Polak states, that cancer of the cervix is noted almost exclusively in women who have borne children or have been subjected to some form of cervical traumatism with incidental infection. Sampson, in an analysis of 421 cases of cancer of the cervix, found that ninety-seven per cent. of the total number had been pregnant one or more times. Hence, it must be admitted that the most important predisposing influences in the pro-

duction of cervical carcinoma are the traumatisms of childbirth which expose the cervical tissues to the incidence of infection, which, in turn, increases the cell activity in the region of the wound thereby supplying the necessary chronic irritation for active cell proliferation. Bonney states that in all cases of cervical cancer examined by him there were evidences of erosion and cervicitis, and these conditions are more likely to become unhealthy and persistent with repeated pregnancies.

The cervix is infected in a large proportion of women, sixty per cent. to seventy per cent. as shown by clinical records. This includes every degree of cervicitis, from the inflammation in the conical infantile cervix of the nullipara to the very severe infections accompanied by either lateral, bilateral or stellate tears. This infection, according to Sturmdorf, pursues a slow, insidious course. It is primarily an infection of the deeply situated terminal tufts of the endocervical muciparous glands. These glandular saccules harbor the infecting organism for years or a lifetime. Their distention from duct occlusion honeycomb the cervical tissues with the so-called Nabothian cysts. This infection invades the length and breadth of the cervical mucosa from external to internal os. In this condition there is an extension of the cervical canal inflammation beyond the external os on to the vaginal portion of the cervix, where it is subjected to friction against the vaginal walls and the constant irritation of the acid vaginal secretions, the epithelium on the surface thus becoming part of the general infection that began in the cervical canal. To these red inflamed surface areas, the name cervical erosion or ulcer has been applied. We know now that all these pathological processes are part of the inflammation in the cervix and that endocervicitis as such involves both the cervical canal and its contiguous vaginal covering.

Cancer of the cervix develops within the areas thus involved. Normally, the cervix shows two distinct forms of epithelium—1, stratified squamous epithelium covering the vaginal layer, and, 2, columnar epithelium lining the cervical canal and racemose glands within the cervix, continuous and identical. Hence, the origin of the squamous and glandular types of cervical cancer.

That endocervicitis today must be considered the starting point in all cancers of the cervix is, I think, a position accepted by all authoritative pathologists. Chronic endocervicitis is definitely a pre-cancerous condition. As Wilson of Birmingham, England, states: "At present there is a practical unanimity in the view that in its beginning cancer is distinctly a local affection, and this is especially so in the local affection of the cervix." Graves states as follows: "It is distinguished among other neoplasms of the body by having a very definite and constant factor in its histogenesis because it occurs almost exclusively in cervixes that have been the seat of some inflammatory or traumatic lesion." Ewing definitely observed the development of cancer in the cervix and determined its etiological factor. He studied three instances of polypi in eroded cervixes showing metaplastic overgrowth and beginning invasion of the stroma by adenocarcinoma. He

states boldly that chronic endocervicitis precedes cancer in the great majority of cases, and that cervical erosion is the most definitely established lesion known to initiate cervical carcinoma. Polak in thirty-four out of forty-eight cases established the same sequence. Beckman observed the development of carcinoma in an erosion which he treated for five years. Early stages of carcinoma from chronic endocervicitis are also described by Waldeyer, Ruge, Veit, Cullen, Shauenstein, Sitzenfrey and others.

In this connection I shall report only two cases out of a number that were observed by me.

CASE I.—Mrs. H., aged thirty-two, para III, had been treated by me for lacerated cervix chronically infected. This treatment was carried out for the greater part of a year. She refused surgical intervention and disappeared from observation. She visited me six months later complaining of foul smelling discharge of three weeks' duration. Examination revealed a soft friable mass situated on the posterior lip of a tear, and extending into the cervical canal; the uterus was freely movable. Diagnosis of cancer of the cervix was confirmed by Dr. Sturmdorf and a typical Wertheim operation was performed. This specimen was shown by me at that time at a meeting of the New York Physicians' Association. Here was a definite cancer that had engrafted itself upon an old standing cervicitis and one that I had been able to watch.

CASE II.—Mrs. T., aged forty-two, para IV, had been under treatment for six years at various times: had always refused surgical measures. Examination of her cervix showed an infected tear on the left side extending almost to the fornix, constant irritating discharge present, also typical periannexitis. The patient visited me the last time in October, 1920. The cervix had undergone change as follows: There was a hard indurated feel about the cervix, the discharge had become serosanguineous in character and very foul smelling; uterus was freely movable. Diagnosis of beginning cancer confirmed by Dr. Sturmdorf and a Wertheim operation performed.

There is no doubt in my mind that had these two patients been operated upon earlier for endocervicitis cancer would not have developed. This contention is in line with the dictum as laid down by the American Society for the Control of Cancer, i. e., secure early treatment for irritating discharges from the uterus or the vagina and have any injury promptly repaired. W. J. Mayo, in speaking of the increase in the number of cancers, states that one means of preventing this increase is the universal appreciation of the fact that chronic irritation is the great underlying cause of the disease, and that the attack against the large incidence of cancer lies first in removing causes, that is, the avoidance of all sources of continued or repeated local irritation. He emphasizes the need of early recognition of not only the cancerous, but, what is far more important, the precancerous condition, and remedying them.

There is probably no part of the body that lends itself to prophylactic treatment in connection with cancer as does the cervix. The cervix can always

be exposed, the endocervical inflammation studied and the correct method of procedure carried out. If we are agreed that cervical erosion, ulceration, or what we now know to be the different stages of endocervicitis, is definitely a precancerous condition, and, as such, lends itself readily to true malignancy in a great number of cases, the problem of prophylaxis becomes simple. The mere fact that all endocervical inflammations do not degenerate into malignant conditions should in no way deter us from correcting any inflammatory process in the cervix. We have not as yet reached the stage whereby we can predicate just which cervix will undergo malignant change. From our present knowledge and experience the safest course to pursue, it seems to me, is to consider every case of severe cervical inflammation a potential cancer and treat it as such. In this manner we can safely be assured that we can eradicate the great majority of cervical cancers.

The cure of endocervicitis can be obtained by surgery alone. Medical treatment for this condition is a delusion, and does harm by causing loss of time and giving the patient a false sense of security. This form of treatment should be entirely eliminated.

In dealing surgically with the cervix, there are four recognized methods of procedure. The first two, trachelorrhaphy and low amputation of the cervix, are mentioned only to be condemned, for not only do they not cure the endocervicitis, but leave the inflammation in the cervical canal practically intact with all its cancer possibilities. The third method, high amputation of the cervix, will eradicate the diseased area since it takes away the entire cervix, the diseased mucosa, muscle and all. This operation, like the others, is open to serious objections. Leonard, who made a study of these three surgical procedures in a series of 128 postoperative cases from among 400 patients operated upon in the Johns Hopkins Hospital, came to the following conclusions:

1. Nearly five per cent. of the patients presented postoperative hemorrhages occasionally after established convalescence.

2. Ten per cent. of the patients suffered from a decided augmentation of a preexisting menorrhagia or dysmenorrhea.

3. Four fifths of the women in whom pregnancy might reasonably be expected to follow remained sterile, fifty per cent. of the pregnancies occurring after cervix amputation terminated prematurely, while among the few who progressed to full term even a larger proportion experienced difficult and prolonged labor. These were his conclusions in the typical amputation cases.

His conclusions for trachelorrhaphy are that it cannot be considered, like amputation of the cervix, a curative measure for this condition.

The ideal plastic operation for endocervicitis must conform to the following demands—it must eradicate the entire diseased area without obliterating the physiological function of the cervix.

These two factors are ideally met with in the fourth method of treating the cervix or what is now known as the Sturmdorf tracheloplasty operation. By means of this operation the entire diseased area

is removed leaving only the musculature of the cervix intact, thereby preserving the physiological function.

In my experience of over eight years with this operation covering a great many cases, I have been able to note with entire satisfaction to myself and patients the following results:

1. There have been no postoperative hemorrhages except that the first menstrual period following the operation, in some cases, is slightly more exaggerated than other periods.

2. Dysmenorrhea and menorrhagia were improved in some cases and cured in a great majority.

3. I have records of many cases in which after repeated miscarriages normal pregnancies took place after this operation. That these postoperative pregnancies terminate normally in every respect is, to my mind, one of the most important assets of this procedure.

This operation is ideal because it meets and ful-

fills all physiological demands, meets and eradicates the pathological conditions present, and obviates the shortcomings of the other methods mentioned above.

Lastly, and what is germane to the subject at hand, it removes just those diseased infected tissues in which we know cancer of the cervix develops, and once removed all possibilities of future cancer in this area become negligible.

I would epitomize my conclusions as follows: The morbidity and mortality of cervical cancer operations at the present writing approximate forty to fifty per cent. Chronic endocervicitis is an established precursor of cervical cancer. Tracheloplasty correctly executed is a cancer prophylactic, hence the teaching to postpone all tracheloplastic procedures until after the childbearing period, still advocated by some, thus exposing the irritated cervix to further traumatism, is both fallacious and pernicious.

1057 HOE AVENUE.

Obstetrical End Results of the Tracheloplastic Operation*

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During the past few years, the question has been agitated by the general practitioner and the specialist, as to whether to advise cervical repair in women who are still in the childbearing period. This uncertainty is due to the fact that there still exists some confusion of the newer method of repair with the older methods; namely, Emmet's trachelorrhaphy and Sims's amputation. Physicians, knowing the end results of the latter operations, often tell their patients that any repair of the cervix should be postponed until the time when they shall have passed into the climacteric period. Such advice has been published by Green in a recent edition of a book on diseases of women. He says: "Under these circumstances it is well to postpone the surgical repair at least until the menopause, for the reason that, on the one hand, unsuccessful trachelorrhaphy may so far distort the cervix or unduly diminish its lumen that dysmenorrhea, or even sterility, may result; or, on the other hand, the subsequent labors may again result in laceration. Generally, with perhaps occasional local treatment, the lesion may be left until the functional activity of the uterus is over. 'The ship may often wisely be allowed to finish her voyage before she is placed in dry dock.' The danger of possible malignant neoplasm must ever be borne in mind. Unrepaired torn cervixes should be inspected from time to time, perhaps occasionally treated, and the skilled sight and touch can easily determine when it is necessary or judicious to resort to trachelorrhaphy or amputation."

With this quotation in mind, contrasted with my observations of eight years, I am prompted to write this paper in order to elucidate the conditions which require the tracheloplastic operation, comparing this

method with the other methods of repair, as to technique and end results, thus showing that there is no need to expose these patients, by waiting, to the possibility of developing annexal disease, or to the further possibility of becoming victims of carcinoma of the cervix, especially since the proper and timely treatment is not attended by any serious immediate dangers or later aftereffects in the process of labor. This operation may therefore be considered a prophylactic measure.

The indications for the repair of a cervix are at present viewed differently than heretofore. We know now that the symptoms of cervical disease are due to the presence of an endocervicitis. Emmet's trachelorrhaphy was founded on the fact that the symptoms were due to the gaping of a torn cervix. He observed that "whenever the rent has extended into the vaginal junction or beyond, there will exist a tendency for the tissue to roll out from within the uterine canal, as soon as the female assumes the upright position. As soon as the flaps formed by the laceration are once separated, their direction of divergency becomes increased by the anterior lip being crowded forward in the axis of the vagina toward the outlet, in the direction presenting least resistance, while the same force naturally crowds the posterior lip into the cul de sac. From forcing the flaps apart, a source of irritation is at once established, which arrests the involution of the organ, and the angle of laceration soon becomes the seat or starting point of an erosion, which gradually extends over the everted surfaces."

These pathological changes in the lacerated cervix and the symptoms which those patients complained of were attributed to the erosion in the angle of the tear. Emmet accordingly denuded the raw surfaces and excised the diseased angle, then sutured

*Read before New York Physicians' Association, May 26, 1921.

the surfaces together with several strands of silver wire. Trachelorrhaphy thus became a very important operation in November, 1862, and is still being performed by many surgeons with the hope of relieving their patients of a distressing condition. While the cosmetic appearance of the cervix is improved by this operation and the gaping mucosa is protected from constant irritation, patients continue to complain of pain and discomfort in the pelvis, because the real indication for the cervical repair was not eradicated.

The conclusions of V. H. Leonard, who had made an exhaustive study of the aftereffects of Emmet's trachelorrhaphy on patients operated upon at the Johns Hopkins Hospital, are very interesting. Summed up, they show that trachelorrhaphy should not be performed in the presence of chronic endocervicitis. When this operation is performed, it cannot be considered a curative measure, but will render a mild endocervicitis more amenable to treatment. Leonard's conclusions are correct in so far as Emmet's classical trachelorrhaphy is concerned. This operation necessarily leaves the greater portion of the infected endocervical mucosa *in situ* to perpetuate the symptoms, with the result that sooner or later the annexa become involved and derangement of function follows. The aftereffects of Emmet's trachelorrhaphy on the future marital history of these patients, according to Leonard, are more encouraging than those following Sims's amputation; but as to the permanent cure of chronic endocervicitis, the result is rather disappointing.

Amputation of the cervix has long been an established operation. Lisfranc, in 1815, frequently performed it for what he considered to be cases of incipient carcinoma. After performing cervical amputations according to the old method, by cutting away a wedge shaped portion of the cervix as far as the internal os and allowing the raw surface to heal by granulation tissue, Sims, in 1861, devised the newer method of complete transverse amputation. He amputated a part or the entire cervix and united the vaginal covering of the remaining stump. He found this method better, as the wound healed promptly instead of taking several months to heal. The sepsis and hemorrhage, which often followed the older type of amputation, became a comparatively rare complication. The patients had a short convalescence.

This operation became popular among surgeons as a means of curing the patients of complaints which were due to the presence of a local infectious focus. As time went on and the end results of this operation were noted, the surgeons began to realize that, while some of the patients were relieved of their complaints, this operation should be postponed until after the menopause had been reached. While many of the surgeons experienced disappointment in the results of Sims's amputation, it was not until 1913, when Leonard published the statistics of the postoperative results of amputation of the cervix, in patients operated upon at John Hopkins Hospital, that the sentiment against amputation began to manifest itself. Leonard's conclusions in connection with the marital histories of these patients coincided with those of many other

observers. He found that in those patients, in whom the occurrence of pregnancy might have been expected, four fifths remained sterile. On the other hand, over fifty per cent. of the pregnancies occurring after operation ended in miscarriage or premature delivery, while the remaining few which progressed to full term experienced prolonged and difficult labor.

While these facts were clearly stated and were very convincing, no one suggested a remedy that would cure the diseased cervix, at the same time obviating such aftereffects as have been depicted by Leonard, until Sturmdorf published his tracheloplastic method of cure and its results. In his elaborate studies on chronic endocervicitis, Sturmdorf calls attention to the fact that the musculature of the cervix is not arranged to form a sphincter, because its fibres, which are continuous with those of the uterine body, do not at any point encircle the cervix, but are disposed in a serried succession of oblique circle segments, which by contracting spirally upward necessarily shorten every diameter of the uterus, and by their uncoiling in the cervix widen the os like an iris diaphragm in a microscope. The infection which takes place in the cervical mucosa manifests itself by a lymphangitis in the musculature of the uterus and around the annexa, producing in time annexal disease with disturbed function. By Sims's amputation, the muscular mechanism in the cervix is removed and the remaining stumps of the muscle bundles become imbedded in the scar, thus interfering with dilatation at the time of labor. Emmet's trachelorrhaphy does not bring about dystocia to the same degree as the Sims amputation, but a focus of infection remains in the cervix which continues to menace the patient's vitality.

Sturmdorf's tracheloplasty may be performed in cases requiring surgical intervention for disease of the cervical lining—chronic endocervicitis—in the nulliparous and in those cases of endocervical infection accompanying lacerations, which may be the result of childbirth or of instrumentation associated with dilatations of the cervix for abortion or other conditions. Sturmdorf emphasizes the fact that lacerations of the cervix, *per se*, are of no clinical significance. They assume importance only when infection is present. This is, therefore, the operation of choice in the very cases in which Leonard asserts a trachelorrhaphy should not be performed.

The tracheloplastic operation is based on scientific observation. It aims to enucleate the diseased cervical mucosa and to reline the cervical canal with a healthy vaginal lining. This is accomplished without destroying the muscular arrangement in the cervix, therefore its effect on future labor is nil.

While the cases I am about to report are fewer in number than those studied by Leonard, they prove that the tracheloplastic operation from the obstetrical end results is very satisfactory. These patients, before the tracheloplasty, suffered from leucorrhoea, menorrhagia or metrorrhagia, backache, and pain in the lower abdomen, either on one or on both sides. On inspection, the cervix showed a laceration of mild or severe form, but in every case the mucosa was inflamed. After the operation improvement followed in nearly every case. One fact

is certain, this operation does not act as a hindrance to conception. I have made a special effort to interview a number of patients who had apparent sterility for four or five years after the operation. These patients told me in confidence that they had been using precautions for varying periods of time, and had to be "fixed up" on several occasions.

CASE I.—B. W., aged thirty-one, para II. Diagnosis, lacerated cervix with chronic endocervicitis, lacerated perineum, rectocele and cystocele. The patient was operated upon on October 29, 1917, at the Polyclinic Hospital, when the tracheloplastic operation with levator myorrhaphy was performed. She was confined on August 1, 1918; normal labor; duration four hours. Patient has been well since.

CASE II.—L. D., aged thirty, para I. Diagnosis, chronic endocervicitis, with periannexitis on the left side. The patient was operated upon on June 15, 1917, at the Polyclinic Hospital, the tracheloplastic operation being performed. She was confined on August 21, 1918; labor five hours; normal baby; patient well; no leucorrhoea; menstrual function normal.

CASE III.—M. G., aged thirty-two, para I. Diagnosis, infected cervix and pelvic abscess. The patient was operated upon in June, 1913, at the Polyclinic Hospital. She was confined with her first baby on January 16, 1918, at the Polyclinic Hospital, and her second baby was born on February 1, 1921, at the Bronx Hospital; labor normal, lasting three hours. Patient has felt well since her first operation.

CASE IV.—R. F., aged twenty-seven, para I. Diagnosis, lacerated and infected cervix; double periannexitis. The patient was operated upon on February 3, 1919, at the Community Hospital, the tracheloplastic operation being performed. She was confined in March, 1920, at the Community Hospital. Labor was normal and the child normal. Menstrual function is normal now and there is no leucorrhoea.

CASE V.—A. C., aged thirty-one, para I. Diagnosis, lacerated infected cervix, right periannexitis. Patient was operated upon at the Polyclinic Hospital on February 15, 1917. She was confined on April 17, 1920, at the Community Hospital, labor lasting six hours.

CASE VI.—S. G., aged twenty-eight, para I. Diagnosis, lacerated and infected cervix. She was operated upon in November, 1918, at the Community Hospital, and was confined at the Bronx Hospital on January 8, 1921. Labor was normal, lasting seven hours.

CASE VII.—L. G., aged thirty-two, para I, married in 1907. The patient was operated upon for sterility in April, 1917, at the Polyclinic Hospital. Menstrual function was regular until February, 1918. She was confined on November 10, 1918; time of labor, five hours.

CASE VIII.—B. F., aged thirty-six, para V. Diagnosis, cystic left ovary, lacerated infected cervix, rectocele and cystocele. She was operated upon in May, 1919, at the Community Hospital, plastic operation being performed on cervix and perineum, and removal of cyst. On July 30, 1921, she was

delivered at the Community Hospital, normal labor, duration five hours.

CASE IX.—P. G., aged thirty-five, para III. Diagnosis, lacerated infected cervix, lacerated perineum, cystocele and rectocele. The patient was operated upon at the Polyclinic Hospital in May, 1914, tracheloplastic levator myorrhaphy being performed. She was pregnant two months when abortion occurred on January 15, 1921.

Matthews, in writing of the end results of the cone operation, as performed in Dr. John O. Polak's clinic, Brooklyn, says: "We have not delivered a sufficient number of these women, in whom the excision of the cervical mucosa has been performed, to draw any definite publishable conclusions, but so far, in a limited number of cases, we are of the opinion that a cervix upon which the cone operation has been done, will cause little, if any, more trouble during pregnancy and labor than one upon which trachelorrhaphy has been performed."

From the numerous successful deliveries by my colleagues, who are doing this work, together with the cases I have cited, my conclusions are:

1. Fear to perform cervical repair in women during the childbearing period is unfounded.
2. Trachelorrhaphy and cervical amputation have outlived their usefulness in gynecological surgery.
3. The tracheloplastic operation should be performed in all cases where chronic endocervicitis exists, whether the cervix is lacerated or not.
4. The bad effect of the tracheloplastic operation on possibilities of future conception, pregnancy, or delivery is nil.
5. The tracheloplastic operation as a cure for chronic endocervicitis acts as a prophylactic measure against more serious annexal involvement, and also prevents the possibility of the occurrence of cancer in the cervix.
6. To do this operation in all the details, as suggested by Sturmdorf, one must see the operation performed on the living patient, as a description of the method for all varieties of cases is impossible.
7. Considering the fact that in the cases reported the patients have given normal birth to living children after tracheloplasty, and recalling Leonard's statistics on Emmet's trachelorrhaphy and Sims's amputation, further comment on the merits of the tracheloplastic operation becomes unnecessary.

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982 WHITLOCK AVENUE.

Drainage in Pelvic Abdominal Surgery

By HOWARD KELLY, M. D.,

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The problem of drainage in lower abdominal surgery is one of perpetual interest, and may still be said to belong in some measure to the realm of moot questions. While the excessive drainage of thirty and thirty-five years ago has been abandoned, there are still left among us those who drain regularly in certain groups of cases, while others with large experience declare they never drain. The original conception of a drain to be left in the abdomen was a bold one, and its widespread use in the early days (late seventies and eighties) undoubtedly saved many lives. It was then not uncommon for surgeons to drain for a few days in seventy, eighty and ninety per cent. of their ovariectomies, and great was the technic of the glass drainage tube. It had to be watched to keep it acting, the gauze plug removed, and the accumulating fluids sucked out; then if it had perforations in the lower end, the omentum worked into these, became strangulated, and was often pulled out with the tube. Then, also, the tract might suppurate and a hernia often followed. Hunter Robb had a technic which was the forerunner of the rubber gloves worn universally today. He never dressed tubes in the wards of the Johns Hopkins Hospital without slipping rubber bottle nipples over his fingers to prevent contamination. This was in the early nineties.

The excessive drainage we used was in reality a confession of weakness in our aseptic technic, the aseptic conscience was not yet so developed in the operator as to act almost automatically. So we fluctuated from ninety to ten per cent. or even to no drainage at all, and lived in a state of mental anxiety and uncertainty, not having the confidence of a generation of experience and feeling our way toward an uncertain goal. Well do I remember our state of startled scepticism roused by Bennie Baer (peace to his ashes!) in the Philadelphia Obstetrical Society, who reported a lot of "pus tubes" operated upon and ruptured in the removal, and yet the abdomen was closed without a drain. We knew that pus was infectious and would kill, and so could not be allowed to remain; at any rate, it was not a safe rule for sane men to do as Baer urged, give up the drain. A little later we discovered that most of the pus in those big old tubes was sterile, or comparatively innocuous and that Baer had made a discovery and was right in about nine cases out of ten.

I was in England in 1886, and judging by the little surgery I saw Tait do, he drained about everything; which act illuminated his dictum that germs were so harmless that if he could get them dry he would use them as a dressing! And now, after thirty years, there is still use for the drain in some cases, and anent this matter I wish to say a few words.

The field of the drain is limited today by a more thorough routine aseptic régime throughout. What we older men had to learn so painstakingly seems as natural as the simple functions of life to our juniors. The bowel is nowadays less frequently injured,

raw areas are covered more carefully, manipulations are more confined to the structures which are removed, the duration of the operation is cut down, and above all we use sterile absorbable catgut and never the dangerous stock braided silk ligatures. If, with all these eliminations, we have brought the surgery of the abdomen so much nearer to perfection, why is there any room yet for drainage? Must we in the occasional case still admit this acknowledged imperfection in our technic, namely, the leaving of a hole in the abdomen to carry off accumulating discharges we would have been glad to prevent?

I feel sure that from time to time the judicious use of a drain over a short period of time, from thirty-six hours to several days, does one of three things: It is an unspeakable comfort to the surgeon to be sure that there is no collection of fluids about the field of operation. It relieves the patient of a vast amount of discomfort in her early convalescence, converting a stormy, febrile recovery into a smooth, peaceful one. It carries off the serum and blood, and, it may be, lingering infections which occasionally give rise to a general peritonitis.

1. I would drain in every case where infectious material has been widespread and there remain some lingering suspicious areas. I include here cases in which there has been soiling by bowel contents.

2. I would therefore drain in all ragged cases, that is, in those where the pelvic adhesions have been so extensive and firm about the floor and walls that the occurrence of considerable serosanguineous weeping is a moral certainty.

3. I would always, without exception, drain after removing a cancerous uterus.

4. I use a small, special drain in most cases of myomectomy, where sometimes weeping and bleeding occur unaccountably.

5. When in serious doubt, I say drain! Some, I feel sure, would reverse this dogma.

Now, a few words as to the drain, where to place it, and how to care for it.

If the trouble in the pelvis is very severe, then a good big drain of washed out iodoform gauze (Max Saenger) in protective rubber tissue ought to be laid through the vaginal vault, to cover the pelvic floor loosely. Never pack it in tightly and never, under any circumstances, allow the drain, however inserted, to extend up or down between loops of bowel. That kind of drain is provocative of obstruction. Let the drain always be peripheral, that is to say, touch or cover some part of the abdominal or pelvic wall, and then lead outside by the shortest possible route. Always give the drain a free vent; do not lay it well and then choke it at the vaginal vault or in the abdominal wall. Such an error is worse than no drain at all, begets false confidence, and may kill the patient. If rubber tissue does not protect the avenue of exit from the drain, the latter will adhere, and it may be necessary to

give gas anesthesia to pull it out. I have no objection to a rubber tube in the centre of the gauze; it is at times a great help. In all bad cases demanding a drain, drainage should be through the vaginal vault, for to this region the fluids inevitably gravitate and by this avenue is provided the route of immediate escape, the great desideratum in drainage.

I desire now to call attention to a form of drain which I have found most useful in my own work, and which, so far as I know, has not been described or appreciated elsewhere. I call it a provisional or a telltale drain. 1. It is a small drain about the size of a cigarette or a little larger. 2. It is peripheral in two senses, it is laid through the abdominal wall at or near the lower angle of the median incision, above the symphysis, reaching well within. 3. No attempt is made to come into contact with the field of the operation which lies, it may be, well below the pelvis. I use such a drain in myomectomies as well as where serious weeping is to be expected, but never where there is reason to expect immediate infection. Its sole function is to let out all the excess of serum and blood welling up from the pelvis and seeking this direction of least resistance. It is temporary in character, being removed in from twenty-four to thirty-six hours, as soon as the outward flow abates, as shown by the dressings remaining dry.

Let me recall a case, of last fall, in which this form of drain was used. The patient had much tympany and extreme discomfort, and gave us

several anxious days, but the presence of the little telltale drain, which showed that the trouble was at least not due to an accumulation of bloody serum, was a source of great relief in determining non-interference. The subsequent favorable course justified our expectations.

In myomectomy, particularly if it has been extensive, patients not drained are often utterly wretched, and pass through a stormy three to five days of extreme discomfort. A little abdominal drain in the lower angle of the incision lets out a considerable amount of serum, and often insures a flat abdomen and comfort, while it relieves the surgeon of much anxiety. Here it is provisional, i. e., used to provide an exit for the excess of serum. It is not a question, apparently, of removing all fluid and blood, but of the escape of the excess by capillary drainage, and so avoiding overtaxing the peritoneum. I find it well at times to stab through the peritoneum, at one side of the lower part of the incision, just before closing the wound. This permits of closing the whole peritoneal incision with catgut. The drain is then brought up through the lower angle of the incision, the rectus fascia, fat and skin. After twenty-four hours all drains should be started out, unless there is still a fairly free discharge. As soon as no decided discharge can be seen on the dressings, say in six hours, then it is time to pull the little drain out, by a twisting motion.

1418 EUTAW PLACE.

The Comparative Value of Whole Ovarian Extract, Corpus Luteum Extract, and Ovarian Residue in Menstrual Disorders

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Of all the glandular extracts at present in use, none are more valuable or wider in their application than the various preparations of the ovary. There are three separate extracts available, differing widely in their indications, administration, and therapeutic value and action. Of course, the ideal material would be of human origin, but on account of obvious difficulties in securing supplies, we must content ourselves with the commercial extracts from the ovary of the sheep, cow, or pig. It is said that the ovary of the pig most closely resembles that of the human being, and theoretically, therefore, should show better results in practice. After an extensive trial, I have not been able to satisfy myself of this.

EXTRACT OF THE WHOLE OVARY.

This is most useful in, 1, the natural menopause; 2, the surgical menopause; 3, the late establishment of menstruation.

Preparations available.—It is supplied in powder, compressed tablets, and ampoules for hypodermic use. The powder or tablets are for mouth administration only. Extract of the whole ovary is much the most efficient in relieving the disagreeable symp-

toms of the menopause. It gives quickest results in the natural menopause; next, in the surgical menopause near the age at which this phenomenon usually occurs; and lastly, in the surgical menopause in young women. This latter is by far the most difficult to control. The symptoms demanding relief are, 1, the hot flashes; 2, nervous disorders; 3, the mental derangement so often seen, particularly depression and melancholia. In this latter condition the effects are often magical.

Dose and method of administration.—After extended trial, I am convinced that the better method of administration is by deep muscular or intravenous injection. For this purpose the ampoules only are used. Both the powder and tablets undergo a certain amount of oxidation, and are manifestly changed to a great degree by the process of digestion. Nausea is a common complaint after administration by mouth; it is absent in the hypodermic use. If the tablets or powder are used, however, the best results are obtained by giving five grains three times a day, midway between meals, combined with one fortieth of a grain of strychnine sulphate. For this

suggestion, the author is indebted to his assistant, Dr. W. W. VanDolsen, and experience has proved its worth.

When the ampoules are used, the amount is one c. c. to each injection, when given intramuscularly, daily for thirty-six doses. After such a series, none is given for one or two months, and if needed the series can then be repeated. It is not wise to stop short of this number, even though, as often happens, the patient is entirely relieved of her symptoms before the series is completed. The effect seems to be cumulative, and many patients are permanently relieved by the first series alone. The author has not had to give more than three series and that in one case only. If more than one c. c. is given by intramuscular injections, there is too much local reaction. This reaction is negligible if only one c. c. is used, and provided the solution is reasonably fresh. It will not withstand long storage and should be kept in a cool place. As a general rule, if the solution becomes dark in color, it is unfit for use. The proper color is light straw. The injections are made with a glass syringe, with a fairly long needle and preferably in the deltoids. The syringe should be boiled and cooled before use, rather than sterilized by alcohol. With proper technic and reasonable care, there is no danger of suppuration at the site of injection. The slight local reaction promptly disappears.

REASONS FOR INJECTION.

I firmly believe, however, that intravenous injection is the ideal method of administration, for the following reasons:

1. The material used is carried directly into the circulation, giving the most rapid absorption possible.
2. It is possible and advisable to use a considerably larger dose (two to three ampoules) than is possible with the intramuscular injection, in which more than one c. c. causes considerable local reaction.
3. Each ampoule contains only two tenths of a gram of the extract, and in this way the necessary total quantity can be introduced more easily and quickly.
4. There is no local reaction or discomfort of any kind after the injection.

TECHNIC.

The technic of the injections does not differ materially from any ordinary intravenous injection. It is most important that rigid care and asepsis be used, however, and for that reason the following technic is detailed. It is one that has proved its safety in many hundred injections.

1. A glass hypodermic syringe of three c. c. capacity is prepared by boiling, and cooled. Alcohol is not desirable as an antiseptic for the springs and needle.

2. The ampoules to be used are washed and rubbed thoroughly with an alcohol pad.

3. The ampoules are filed at the neck and broken in sterile gauze, and the contents drawn into the syringe.

4. A tourniquet is placed on the patient's arm, above the elbow.

5. When the veins become prominent, at the bend of the elbow, a suitable one is chosen and the skin over it painted with seven per cent. tincture of iodine.

6. The needle, attached to the filled syringe, is passed through the skin into the vein.

7. As a test, the plunger of the syringe is pulled slightly back, and if the needle is in the vein, blood will appear in the syringe.

8. The tourniquet is loosened, and the contents of the syringe slowly injected, taking about fifteen seconds to each cubic centimetre.

9. When the syringe is empty, the needle is withdrawn. The small puncture requires no dressing.

10. The same vein can be used repeatedly.

11. In stout women it is often difficult to locate the vein at the elbow. In such cases, the veins in the back of the hand are usually the most accessible.

Sterility of ampoule contents.—This has been proved by an extensive experience with them. In no case has there been any sign of infection.

Reactions.—The average patient shows no general reaction at all. In many cases there is an area of redness around the site of intramuscular injections, with some local tenderness. This disappears promptly, within twenty-four hours, and so far in no case has there been suppuration. In intravenous injections there is no local reaction of any kind. Certain protein sensitive individuals will show some systemic reaction, chiefly as diffuse patches of erythema, urticaria, and occasionally headache. Very rarely there will appear moderate anaphylaxis with some evidence of shock but in my experience this has never been severe. In these cases, however, the intravenous method has been abandoned. One patient, a very neurotic individual, had quite severe vomiting, but of short duration.

Permanence of results.—The most satisfactory results have followed the administration of ovarian extract in cases of the natural menopause; the least satisfactory in cases of the surgical menopause in young women. These latter are the most difficult of all to control. Except in these, the average number of doses to secure permanent relief was one series of thirty-six ampoules. In a moderate number, two series, separated by an interval of two months, were needed. In only one case were three series required. Most of the comparative failures will occur in the early surgical menopause. As a rule, the hot flashes are quickly controlled; the nervousness rapidly diminishes, and most gratifying is the prompt relief of the distressing melancholia, often with suicidal bent, which is so often seen in these cases.

OVARIAN RESIDUE.

As the follicular extract is supposed to control the growth and development of the genitalia, the chief use of the ovarian residue (the portion of the ovary remaining after the extraction of the corpora lutea) is in the following: 1, Late development of puberty; 2, infantilism; 3, irregular menstruation at puberty or within a few years thereafter; 4, the menorrhagia of youth (in these cases often complicated by either hypertrophic glandular endometritis or backward displacement of the uterus); 5, obesity and amenorrhea—*dystrophia adiposogenitalis*.

Preparations available.—1, Ampoules for hypodermic use; 2, tablets containing ovarian residue as one of the ingredients.

Method of administration.—This is the same as detailed for ovarian extract.

The results of this extract are still in the nebulous stage, as far as proof is concerned. We cannot as yet speak as definitely as in the other two. At times results seem to be prompt; in many cases, particularly those of obesity and amenorrhea, they are disappointing. Recently I have been furnished by the manufacturer a tablet containing desiccated thyroid gland two grains, desiccated whole pituitary one grain, desiccated suprarenal one grain, desiccated ovarian residue two grains. Prolonged administration of this, one tablet four times daily, has given results, as will be seen in the illustrative cases appended to this report, but these results are by no means uniform. Still the success has been enough to justify continued experimentation.

CORPUS LUTEUM.

The corpus luteum controls menstruation, prepares the endometrium for reception of the impregnated ovum, and the lack of corpus luteum in early pregnancy is unquestionably one of the chief factors in the nausea of pregnancy.

Uses.—1, The control of the nausea of pregnancy; 2, habitual abortion without demonstrable cause (based upon the theory of rapid absorption of the corpus luteum of pregnancy); 3, menopause (fairly efficient but much less so than the whole ovarian extract); 4, scanty menses or functional amenorrhea of youth; 5, pruritus vulvæ or kraurosis vulvæ in elderly women; 6, sterility.

Preparations available.—1, Tablets; 2, powder; 3, ampoules for hypodermic use.

Administration and dose.—The method of administration is precisely as detailed in the section on whole ovarian extract. Here again the intramuscular or intravenous use is far better than mouth administration.

In the nausea of pregnancy the majority of patients are promptly relieved by a series of twelve doses, given daily by intramuscular use in the mild cases or twice daily in doses of two c. c. intravenously in the severe cases. Relief usually comes after about six c. c. have been injected, but the total of twelve c. c. should be given in every case. The intravenous method is much the better. For all the other indications listed above, a series of twenty-four doses is given.

One word of caution is needed, however. The presence of a goitre in early pregnancy absolutely contraindicates the administration of corpus luteum extract, either intravenously or intramuscularly, for the control of nausea. In my experience I have noted that every such patient has been made much worse by this treatment.

RESULTS OBTAINED.

The statements in this article are all based upon personal experience in the use of the various extracts. The case histories listed below are intended merely as illustrative cases, and no attempt has been made to tabulate all the cases in which the extracts have been used. The case reports are designed to show only what has occurred in these cases, presumably as the result of treatment.

OVARIAN EXTRACT.

CASE I.—A multipara, with four children, showed first evidence of the menopause at forty-eight. The

hot flashes were severe, but particularly was there a melancholia with strong suicidal tendencies. This patient was given whole ovarian extract, hypodermically (not intravenously) for thirty-six doses. After the eighteenth dose she had no further untoward symptoms, the melancholia disappeared, hot flashes ceased and did not return after the completion of the series. No second series was needed in the eighteen months this patient was under my observation after the completion of the first series.

CASE II.—Another multipara, aged forty-seven. Abrupt onset of menopause, with violent mania. This patient required constant watching, though she was not confined in any way. She was given one series of thirty-six doses with marked improvement of symptoms. The hot flashes were entirely controlled, and the mental symptoms were very markedly diminished, beginning at the twelfth dose. The relief was not complete, however. A second series was begun, but almost at the start this patient contracted influenza, and died of bronchopneumonia within four days.

Ovarian extract intravenously is now my routine practice in all cases of hysterectomy. It is begun on the third day after operation and continued (two c. c. a day) until the patient leaves the hospital on the twenty-first day. As a rule these patients show no evidence of menopause at all. They are told to report at regular intervals, and if necessary are given further doses as their symptoms seem to require. Most of them do not require any additional medication at all.

OVARIAN RESIDUE.

The results here are not so easy to detail. In most of the cases there is an improvement in the patient's general health and feelings, without any definite points upon which a finger can be placed. Patients say they feel better, but other than this statement concrete evidence is often lacking. This is especially true of those cases where the compound pills mentioned have been used.

CITATION OF CASES.

CASE I.—A young married woman, aged twenty-three, presented herself with a history of irregular menses, once an interval of five years with no period. Menstruation was established at thirteen and the patient's general health was satisfactory. Examination showed a very small, ill developed uterus with no evidence of pelvic disease. She was put upon hypodermic injections of corpus luteum and the compound tablets mentioned. After one month's use, treatment was interrupted, and examination after four months showed no improvement. Treatment was begun again; after four months' constant use, she had a normal period, lasting longer and the discharge more profuse than any she had ever had. Examination after this period was completed showed a marked increase in the size of the uterus, which has remained, though no further periods have occurred. This case can be cited as a partial success at least.

CASE II.—A very stout woman, aged thirty-two, presented herself with a history of irregular periods since their beginning at twelve. A six to eight months' interval was nothing unusual. She was

married at twenty-one, and though no precautions were taken she had never conceived. Examination showed a uterus about half the normal size, and no evidence of pelvic disease. She was given hypodermics of ovarian residue one c. c. daily for thirty-six doses, and also the compound pills. After twenty-four doses she had a regular period lasting four days, which occurred at twenty-eight day intervals for four successive periods. Then they ceased. Three months later the patient reported, much disgusted at the failure of her periods to continue. Examination showed her three months pregnant. She went to term and was delivered of a healthy boy. This is the only complete success in all the cases treated by ovarian residue.

CORPUS LUTEUM.

In this field success is the usual but not the invariable result.

Nausea of pregnancy.—I have published on four occasions my results with controlling the nausea of pregnancy by the hypodermic or intravenous injection of corpus luteum extract. My percentage of success has been eighty-nine. Many reports from widely separated sources show very closely the same results.

Habitual abortion without demonstrable cause.—Based upon the theory that if the corpus luteum of pregnancy were blighted or rapidly absorbed the ovum was cast out of the uterine cavity, in the past five years I have treated four such cases where no cause could be found for the repeated miscarriages. The Wassermann test was negative and there was no demonstrable pelvic abnormality or disease. In Case I the patient had had four abortions, all prior to the third month; in Case II there were five, one going as far as six months; in Case III, the patient had had ten, all prior to the third month. In all three patients hypodermics of corpus luteum were given, one c. c. daily for twenty-four doses, and all three went to term and were delivered. The treatment was begun as soon as the patient found she was pregnant. In Case IV the patient had had four abortions, one at four months and the others prior to the third month. She was given the same dose as the others, and aborted for the fifth time in spite of it; a total failure. These cases are rare, but the results briefly detailed in the cases given justify a trial at least.

Menopause.—Corpus luteum extract controls the hot flashes but not the mental disturbance, and is not as efficient in these cases as in the whole ovarian extract.

Scanty menses.—One patient, whose menses, normal at first, gradually diminished to a duration of half a day, over a period of two years, without any demonstrable pelvic abnormality, received hypodermically thirty-six doses of corpus luteum extract. The period following the completion of this series (one period during the series being unaffected) lasted two days, and gradually increased so that after four months they lasted three days and apparently resumed the cycle that was normal for her before the reduction begun. She had not relapsed one year and six months later.

Pruritus vulvæ.—While corpus luteum extract has been enthusiastically recommended for this distressing condition, the three patients treated by it in my practice were complete failures.

Sterility.—In these cases, due most often to infantilism and anteflexion and stenosis, the favorable results are unquestionably increased by a combination of a dilatation without curettage, the use for twenty-four hours of Schatz's metranoikter and the administration of twenty-four doses of one c. c. of corpus luteum extract.

EXAMPLE OF USE.

CASE I.—The patient, thirty-five years old, married eleven years, and sterile though ardently desiring a child. She had had three previous dilatations, without result. She was dilated for the fourth time, wore a metranoikter for twenty-four hours and received twenty-four doses of corpus luteum extract. She conceived and was delivered at term a year almost to the day from the time of her fourth dilatation.

Many similar cases could be cited from my practice. It should be stated, however, that no treatment for sterility is ever instituted in the wife until the husband has been examined and pronounced able to procreate.

CONCLUSIONS.

As a result of experience, I am able to formulate the following conclusions, if conclusions they may be called.

Results are not invariable with any extract, but if intelligently used, a good degree of success can be expected; excepting always the use of ovarian residue, where the results are considered decidedly nebulous.

Results are often slow, particularly in menstrual disorders, and patience is one of the prime requisites, in both patient and doctor.

Results are most prompt in the menopause with the whole ovarian extract, and in the nausea of pregnancy with corpus luteum extract.

Cooperation between physician and patient is needed, and overoptimistic statements are to be avoided. The tendency is to expect too much and too quickly.

The most discouraging results are with the cases of obesity and amenorrhea.

We are only at the threshold of the problem of all the glands of internal secretion. I believe that future development will be along the lines of pluriglandular therapy, due to the probable correlation between the pituitary, thyroid, mammary gland, suprarenal, and ovary, rather than in the use of single extracts. Especially will this hold true in the developmental anomalies of the genitalia.

I have endeavored to set forth the results of my own fairly extensive experience in the use of the three ovarian extracts, and also to set forth the facts as they have occurred. I am indebted to my assistants, Dr. Van Dolsen, Dr. Mazer, and Dr. Wachs, for many valuable hints and reports of results in clinical cases, from which, together with my own, the technic detailed above has been formulated.

1823 PINE STREET.

Dysmenorrhea*

By JOHN VAN DOREN YOUNG, M. D.,
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This subject is of such vital importance to the health and well being of so large a number of women, and so often is relief sought at the hands of the doctor, that it seems well worthy of careful study and discussion, in the hope that some light may be thrown on the cause of a symptom that has been treated as an entity and not as the result of some underlying pathological condition. A search for the cause of true dysmenorrhea leads naturally to the question, What is menstruation? Secondly, Is it normally painful? The answer to the second question is No. The answer to the first question must be brief, as the limitations of space will not permit a full discussion of this most complex of functions.

So far as the patient is concerned, normal menstruation is a periodical discharge of blood from the uterus every twenty-eight days, without pain. There is a normal prodrome, and a feeling of fullness until the flow is well established; the blood is darker than ordinary bleeding, of peculiar odor and does not clot. Sturmdorf has shown that blood from the uterine wall of a menstruating woman possesses all the characteristics of ordinary blood, while blood from the uterine cavity of the same woman at the same time will not clot and will prevent other blood from clotting. This points to a biochemical hormone either secreted by the ovary or caused to be formed in the endometrium by the hormone of the corpus luteum. The impelling force that causes the ovule to ripen and determines the formation of the yellow body is unknown but the menstrual cycle has been exhaustively studied.

Briefly, the problem may be stated as follows: The hormone of the ovary must reach the endometrium and there are only three possible channels by which it can do this, namely, the tubes, the lymphatics, and the blood stream. The large number of tubal divisions, with implantation of the stump, double salpingectomies, and cases of complete occlusion from disease, furnish ample proof that the elimination of the tubes does not interfere with normal menstruation. Leopold has demonstrated that the lymphatics originate in the glands of the cervix and extend upward and outward through the uterine wall to the broad ligaments; thus from their course they are ruled out. From the foregoing it may be seen that the blood stream is the only possible route for the hormonization of the endometrium, which indicates one explanation of true dysmenorrhea.

At this point I desire to call attention to certain anatomical and physiological facts. The uterine muscle bundles are arranged as fanshaped muscles, which wind spirally downward from the fallopian tubes to the external os. There is no cervical sphincter, therefore cervical dilatation must be synchronous with the uterine contractions. The lymphatic glands of the cervix are drained by the lymph

channels which, as before noted, run upward through the uterine muscle, then outward to the broad ligaments. Their importance as carriers of infection is at once apparent. "The myometrial sensory nerve filaments penetrate the muscle sheaths, hence the normal uterine contractions, intensified during menstruation, compressing the infiltrated perimysial areas become painful." (Sturmdorf.) An immobile muscle degenerates.

The arterial blood supply to the uterus and annexa is greater than any other portion of the body of like size, thus providing for the function of menstruation and the growth and development in pregnancy. The uterine veins have no valves, also an essential provision for growth in pregnancy. The circulatory changes of ovulation and menstruation are the precursors of a possible pregnancy and differ only in degree.

Henricus and Lieb have shown that the uterine circulation is kept up by a rhythmical relaxation and contraction of the uterine muscle during the entire menstrual life. Accepting these statements as facts, may it not be an explanation of true dysmenorrhea that a deficient ovarian function, with normal myometrium, would cause a lack of endometrial hormone and a profuse clotted flow, while a degenerated uterine wall would cause a mechanical barrier to the circulation and a scanty flow with just as severe cramps, the pain, in the first case, being due to the unhormonized blood clotting, and in the second, to a muscular spasm of the wall, the result of an effort on the part of the uterus to perform its function. In both cases the endometrium has no part in the causation of the pain.

The part played by the cervix in dysmenorrhea has been greatly overestimated, but it is none the less important, first, as an index to the uterine muscle, and second, as through its glands infection is carried by the lymphatics upward into the uterine wall and outward to the annexa. It is seen, therefore, that changes in the uterine wall, causing circulatory stasis are due to a lack of development, an inactive muscle degenerating, and to a lymphangitis from infected cervical glands.

At this point I wish to call the attention of the endocrinologists to the fact that the condition of the uterine wall must be reckoned with as a barrier to the circulatory cycle and endometrial hormonization, in their relation to ovarian, thyroid and pituitary imbalance. If you will consider for a moment the menstrual cycle of a woman, with its psychic, neurotic, and physical disturbances, due to ovulation, circulatory stimulation, congestion, preparation for gestation, uterine overactivity, hormonization, endocrine disturbances, and lastly, bleeding from the uterus, you will see that we are dealing with a very complex function and one vitally concerned with the psychophysiological cosmos of the woman, and will not attempt to cure these cases by treating only the end result, namely, the bleeding. This will diminish the far too frequent operation of dilatation and cur-

*Read before the West Side Clinical Society of New York, May 12, 1921.

etage for the cure of dysmenorrhea, for surely the removal of the unoffending endometrium can do little good and the fibrotic cervix is sure to contract. Flexions and the fibrostenotic cervix are but later developments of the pathological condition just considered.

Of the various malpositions of the uterus, retroversion, physiological and pathological, and these positions with proclivita, may be associated with true dysmenorrhea, or may cause pain from congestion of the pelvic visera alone. New growths, of which fibroids and polyps are the most important, especially the intrauterine pedunculated type, cause pain that is a miniature labor, due to the efforts of the uterus to expel the tumor. The pain is most severe in mural fibroids, especially where they are not extremely large and are truly intramural.

The general condition of the patient and the constitutional diseases must be dealt with as important factors in menstruation, but it is not to be forgotten that some well developed women suffer severely.

The type and character of the pain are suggestive as to diagnosis. The antecedent and menstrual psychoneurotic disturbances are due to endocrine imbalance, and the headaches are due to endocrine imbalance or to pelvic reflexes. The cramplike pains of true dysmenorrhea with scanty flow are myometrial in origin, but may be associated with endocrine imbalance. The pain stops after the flow is established, that is, after the hormone has overcome the barrier and reached the endometrium and established normal hormonization. Where there is profuse bleeding, with clots and cramplike pains, but without gross lesions, deficiency in the hormone is the cause, due to endocrine imbalance. Pelvic fullness, backache, bearing down pain, ovarian neuralgia, and the multiple pelvic reflexes are due to pathological conditions in the pelvis, outside the uterine body.

The object of this paper is to outline briefly the lesions of true dysmenorrhea, a condition without gross pathology, but causing as much suffering as any other factor in human ills, and to urge that the endometrium be spared, because it is a functioning organ and seldom involved as a causative factor in dysmenorrhea. I wish to call attention to the pathological myometrium as a cause of dysmenorrhea and also as a barrier to endometrial hormonization. Careful study and examination of each patient and complete histories will enable us to make a differential diagnosis as to the cause of the pain, to reestablish function, and correct the true pathological lesions, thereby sparing us the ignominy of a curettage that might remove a normal endometrium and cause a persistent amenorrhea and sterility without relief from the pain.

That pathological conditions of the myometrium are causative factors in the production of dysmenorrhea is borne out by the relief obtained in some cases of muscular insufficiency by the use of the stem pessary, and the usual relief after childbirth, as both undoubtedly develop the myometrium, dilatation of the cervix being only a secondary result. The cases in which no relief is obtained from the use of the stem pessary are probably due to endocrine imbalance, to structural deformity, to a failure to stimulate myometrial development, or to infection

caused by the stem setting up lymphangitis and subsequent myometrial inflammatory changes which are more disastrous to the patient than the condition for which the pessary was used. This justifies a most emphatic word of caution to the advocates of the stem pessary, because the lymphangitis does not stop at the myometrial destruction, but passes out in the broad ligaments to the annexa, setting up a local peritonitis with kinking, twisting, and clubbing of the tubes and a consequent sterility and even more extensive and destructive results. Therefore a stem, even of glass, which is the only kind to be considered, must not be used in the presence of any cervical or other infection, and the strictest asepsis must be followed in their insertion. Dilators have the same objections and the same limitations.

In the congenitally long, conical cervix a tracheloplastic operation is indicated, but I do not consider that mutilating operations on the normal, or nearly normal, cervix are ever justifiable, as they attack only the cervical portion of the pathological lesion and substitute a traumatized cervix and one freely open to infection for that which was nearly if not quite normal. It is axiomatic that all indicated pelvic surgery must be done if such conditions cause pelvic circulatory stasis. In this class of cases pathological

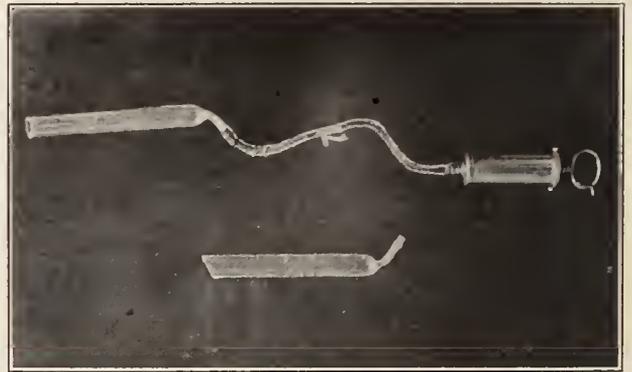


FIG. 1.—Suction syringe for the production of rhythmical uterine stimulation.

mechanical retroversion cum descensus is the deformity most frequently met with, and here the indicated operations are the shortening of the uterosacral ligaments by my method and shortening the round ligaments by the method of Hirst. These procedures permanently correct the deformity, and as the abdomen is open, all indicated pelvic surgery can be done. I have had no experience with the incision of the uterine muscle at the internal os as devised by J. C. Taylor, but it would seem to me to be open to the same objections as are made to any procedure that considers the cervical stenosis as the prime factor in dysmenorrhea.

Drugs, other than the endocrines, have been used from time immemorial, and may be divided into those that are given to relieve pain only, that is, the antispasmodics, and alcohol, given by mouth, rectum, inhalation or by hypodermic injection. That they possess value is admitted. They are immediate in their usefulness and temporary in their relief, but most important is the danger of the use of any habit forming drug for the relief of the recurrent pain of

dysmenorrhea. Local treatment, pelvic massage, light and heat are all of value when used in indicated cases, as they act by improving pelvic circulation.

In searching for a method of producing rhythmical uterine stimulation, and at the same time hyperemia, I devised an instrument which is an application of the Bier's hyperemia method to the uterus. It consists of a suction syringe, a rubber tube with vent valve, and a long glass cup, which fits over the cervix. In some cases the cervical end fits better if bevelled. Cups may be made of any size or shape to meet any indication. The value of this instrument is ease of application and rhythmical regulation of the stimulation. The air cushion is of considerable size, and by the gradation of the exhaustion of the air in the cup the aspiratory stimulation may be carried to any desired degree. (Fig. 1.)

The usual method of procedure is as follows: After sterilization, the cup is placed over the cervix, care being taken to have the os as near the centre of the opening as possible, so that the stimulation will be of the whole uterus. The use of a bivalve speculum is advised, although it is not absolutely necessary.

The exhaust pump is operated by the nurse, one or two tractions of the handle being sufficient. The vacuum is held for a moment, then pressure on the air valve relieves the partial vacuum, and the procedure is repeated rhythmically for from five to ten minutes. This instrument may be used for emptying infected cervical glands or with a small tipped cup the viscid cervical mucus may be removed, in both cases rendering the application of tincture of iodine or other medication much more effectual. It will be seen that this instrument will produce a rhythmical, intermittent aspiratory uterine hyperemia, and a myometrial stimulation easy of application and regulation. It should be applied twice a week at first, then once a week, later just before the menstrual period.

I have been using this method of myometrial and circulatory stimulation and lymphatic drainage for the past year, and am convinced of the soundness of the principle on which it is based. My results clinically have been so gratifying that I feel justified in bringing it before you with my full endorsement.

16 EAST SEVENTY-FOURTH STREET.

Report of Two Cases of Acute Inversion of the Uterus

By W. P. MANTON, M. D., F. A. C. S.,

Detroit.

ACUTE INVERSION DURING THE THIRD STAGE OF LABOR.

CASE I.—Mrs. E., para II, aged thirty, was normally delivered at her home of a living female child in 1911. Two years previously the first confinement had been terminated by midforceps for inadequate pains, and a quite adherent placenta was removed manually. About fifteen minutes after the birth of this second child, Credé's method of placenta expression, which I am accustomed to employ in all cases, was carried out without force, and at the same time slight traction was made on the cord, the arterial pulsations having ceased and Strassman's sign being absent. As no response was made to these attempts and the uterus remained firmly contracted, I left the room for about ten minutes, but was then hastily summoned by the nurse, who said that the patient was having a hemorrhage. Investigation, however, showed this to be a mistake, the nurse having been somewhat nervous and excited. Very slight traction was again made on the cord to see if the placenta had been caught and was being held in the lower segment, and at the same time the other hand was placed on the abdomen. Much to my surprise the previously well contracted uterus had disappeared.

The patient being under mild chloroform anesthesia, the hand was at once introduced into the vagina where the afterbirth was found blocking the upper part of that canal. The placenta was then slowly and carefully drawn downward and out of

the vulva, when it was found that an elongated mass of pale pink color, about the size of a Bartlett pear and covered by ovular membranes, accompanied the secundines. It was at once recognized that this body was the inverted uterus with adherent placenta. Although the attachment was quite firm, the latter was quickly peeled off. There was no particular bleeding. The organ, now decreased in size, was easily grasped by the hand, the fingers extending along the neck and the tips indenting the parts within the constricting ring, while at the same time steady pressure was made, upward and forward, on the fundus. The abdominal walls were so flaccid that the constriction ring could be readily felt from above, and the rather rapidly reinverting organ distinguished as it pushed upward through the opening.

The intrauterine hand was held for a few moments in the cavity, contractions being promptly established, and the latter was then washed out with a mild, hot lysol solution, and an ampoule of aseptic ergot injected into the thigh. For an hour following replacement the uterus was held and controlled through the relaxed parietes. There was a constant tendency to retroflexion, but the organ could be readily brought forward and maintained in position, while retraction continued firm.

The same evening the fundus was on a level with the umbilicus, and no tendency to inversion was manifested. The pulse at the time was 100 and the temperature 98.6° F. During the third day postpartum the temperature rose to 101° F., and a small, foul smelling piece of membrane was expelled. The

*Read before the Detroit Academy of Medicine, March 8, 1921.

next day several small shreds of membrane were thrown off, but the temperature remained normal, and continued so during the remainder of the puerperium. Catheterization was necessary for the first three days, due to swelling of the parts from the slight traumatism incident to the reposition of the uterus. The patient made an uninterrupted recovery and was dismissed on the twenty-first day in excellent condition, the well retracted and the involuted uterus being retroflexed.

My notes state that what impressed me at the time was the absence of shock, which is usually considered the most dangerous feature of the accident; the slight blood loss; the smallness of the uterus, and the readiness with which it could be replaced.

Six years later I again delivered the patient of a living premature (eight and a half months) male infant without difficulty. The placenta was slightly adherent and had to be detached manually, but there was no tendency on the part of the uterus to invert. It is worth noting that in this case, from the time that the uterus was found inverted to the completion of the replacement not more than three minutes elapsed; and so little physical disturbance resulted from the accident that the patient was not aware to this day of the serious complication that threatened her wellbeing.

ACUTE INVERSION OF THE UTERUS.

CASE II.—Mrs. R., para 1, aged twenty-six, a patient of Dr. W. H. Acker, of Monroe, was delivered by a low forceps April 8, 1915. Following delivery there was some hemorrhage and considerable shock, which was controlled by ergot and atropine. No undue traction had been made on the cord, and the nonadherent placenta had come away readily following gentle fundal pressure. The uterus remained well contracted, and the puerperium progressed satisfactorily, no untoward symptoms manifesting. Early on the morning of the tenth day the patient expressed the desire to "pass something"; shortly after which it was discovered that a mass lay in the vagina and projected through the orifice of the vulva. The doctor being hastily summoned, a diagnosis of inversion of the uterus was made, but as the patient was comfortable, there being neither shock nor hemorrhage, no attempt at reducing the organ was made at this time. Two days later, that is, on the twelfth day following delivery, I was asked by Dr. Acker to see the patient in consultation. On examination I found the uterus lying two thirds outside of the vulva opening, slightly enlarged, of a dull red color, and apparently in a healthy condition.

With the patient under ether anesthesia, in the lithotomy position on the kitchen table, I carried out precisely the same manipulations as mentioned in the previous case, and was gratified to find that, although the uterus had been inverted for some days, the method succeeded with as little effort on my part as in the former case. Not more than five minutes were consumed in accomplishing the reinversion. As the cervix was rather deeply lacerated, this was also repaired at this time, and the patient put to bed in excellent condition. Recovery was prompt and progress uneventful; the patient has remained well ever since, but there have been no further pregnancies.

Twenty-five textbooks on gynecology refer to the acute inversion of the uterus, but dwell particularly and *in extenso* on the chronic form which, as Hirst remarks, is so rare that "many experienced gynecologists have never seen a case"; twenty-five textbooks on obstetrics devote much space to the etiology and symptomology of the condition, but largely fail to give the minutiae of treatment.

As to the frequency of acute inversion. Quoting the older statistics—which have been overworked because no recent collection of large numbers of cases has been made—in 280,000 labors in the Vienna clinic but one case of uterine inversion occurred; at the Dublin Lying-in Hospital in 140,000 deliveries there was not a single case; in the St. Petersburg Lying-in Hospital there were 250,000 deliveries without uterine inversion; at the Glasgow Maternity Hospital there were three cases in 51,290 deliveries. More recently but one case in 35,000 confinements is reported from the Sloane Maternity Hospital, and Dr. H. W. Yates, of this city, who has taken pains to gather the statistics from four of our Detroit hospitals which care for maternity cases, finds that in a total of 22,157 deliveries there was but one instance of acute uterine inversion. In the enormous number of 778,537 labors, then, there were just six cases of this complication of childbirth—certainly so infinitesimal a percentage as to approach the vanishing point and warranting writers in classing this accident as the rarest of all obstetrical emergencies.

But is this true?—and here "ariseth a strange matter," for the delver in current medical literature will be astonished by running up against an incontrovertible paradox. The annual indices of published medical articles, for many years back, show that uterine inversion is not the *rara avis* we are wont to consider it. Indeed, Cragin asserts that "most consulting obstetricians of large experience have seen several cases." Figures, it is averred, do not lie, and certainly it would be presumptuous to question the statistics of the leading hospitals of the world; but how are we to reconcile the reports of physicians with the statements of the maternity hospitals. There seems to be but one solution, and that is to tabulate acute puerperal inversion of the uterus as an accident of private practice, largely the result of sloppy, inadequate and unskillful midwifery.

VARIETIES.

For convenience of description and treatment, acute inversion of the uterus may be divided into two varieties: the incomplete, in which the degree of inversion may vary from a simple dimpling in the fundus uteri; and complete, in which the whole uterus turned inside out is extruded into the vagina and possibly escapes from the vulva. The first variety and degree is probably not uncommon—I have personally observed several cases—and this condition usually rights itself. Indeed I doubt if it is often distinguished by the practitioner, since the patient rarely presents symptoms other than a slight increase in the sanious flow. If the etiological factor in its production is continued, however, it may go on to the second degree and a total inversion result, when the symptoms may be exceedingly serious.

ETIOLOGY.

If the uterus is well retracted and in its normal position, it is impossible for this accident to occur, a corroboration of the desirability of the practice which I have always advocated and taught, that the organ should be held and controlled for one hour following every delivery. With a relaxed uterus all things are possible which may render the condition of the patient uncomfortable, or precipitate well-being into serious disaster, from afterpains, hemorrhage and other complications, to inversion. Moreover, the relaxed uterus is more prone to retroflexion—a condition pointed out by Henning as long ago as 1882, as a forerunner of inversion.

To start the inversion, which in most cases begins at the fundus, some force, *a tergo* or *a fronte*, is necessary. Probably the latter is the most frequent cause and is represented by strong traction of the cord to hasten the escape of the placenta. A cupping of the fundus is thus started, and continued dragging pulls down the bulging uterine wall until it assumes the shape of a broad pedicled tumor, while uterine contractions hasten the *dénouement*.

Precipitate labor, delivery in the upright position and a short fundus, act in the same manner. From above, rough and violent pressure in attempts at rapid delivery of the placenta produces a similar effect. In instances of spontaneous inversion, which undoubtedly occur and to which my second case belongs, abdominal pressure associated with more or less strong contractions of the recti muscles may furnish the inciting cause, or causes, acting on a relaxed and softened portion of the fundus, while along the same lines, coughing, sneezing and vomiting in the presence of a relaxed or locally paretic uterus, have produced the condition. The upright or squatting posture, especially with the patient at stool, has given rise to inversion not only early but even during the later weeks of the puerperium. The mortality from this accident is high, ranging up to forty per cent., thus indicating that in inversion of the uterus the physician is dealing with a most serious complication. Death occurs from shock, hemorrhage (acute anemia), and sepsis.

DIAGNOSIS.

The diagnosis of complete inversion presents no difficulties; it is the partial type which is likely to mislead the practitioner and give rise to hasty and wrong conclusions. The bleeding incident to the mishap is likely to be through postpartum hemorrhage, and investigation is therefore postponed until an advanced stage of the dislocation has been reached. Shock may supervene after a prolonged and nagging labor, especially in nervous and hysterical individuals, and anxiety over the patient's state may mask the true conditions to the attendant's mind. In all such instances investigation bimanually is desirable and necessary as soon as the immediate symptoms have been relieved. Only by bearing the possibilities in mind is a successful diagnosis antecedent to successful treatment. In cases which present no symptoms, a knowledge of beginning or accomplished inversion may be obtained only through a constant supervision of the uterus, particularly during the lat-

ter part of the second, and for a time after the completion of the third stage.

TREATMENT.

The treatment should be largely prophylactic through avoidance of unjustifiable violence, especially in the third stage of labor. In dealing with the actual occurrence, the discovery of a vaginal tumor being the earliest intimation of the event, the condition of the patient must be first considered. If there is much shock or hemorrhage, these must receive immediate attention before any attempt at the reduction of the inverted organ is made, and the patient put in as good condition as possible before administering the anesthetic.

When taxis is attempted, it must be remembered that gentleness and speed are of the utmost importance. Should the placenta be adherent, as it is in a considerable number of cases, it must be peeled off the uterus as quickly and thoroughly as possible without doing damage to the organ. This reduces the size of the tumor and facilitates its reduction. If the uterine body is still within the cervix, the introduction of a small Voorhees bag through the cervical ring and gradually distending this with warm sterile water, may, by elastic pressure, cause the fundus gradually, or, more likely, rapidly to spring upward into position. Lacking the bag, gentle packing with sterile gauze may be tried, but the utmost caution must be taken not to rupture or perforate the uterus, which is sometimes greatly softened and even friable. When the uterus lies in the vagina or has escaped from the vulva, the technic is as follows: the hand, with the fingers pressed together forming a cone, is introduced into the vagina with its dorsal surface toward the sacrum, the fingers being extended along the neck, with the tips, if possible, inside the constriction ring. With the body of the uterus lying in the palm of the hand, the former is gently squeezed between the palm and the thumb like a sponge, to remove as much of the contained blood as possible and render the organ smaller. This, I consider, is of the greatest importance as the preliminary step. At the same time the finger tips within the cervical opening, or, when this is impossible, at the sides of the ring, attempt to dilate the constriction with simultaneous upward pressure. Coincident with this, the fundus and body of the uterus still lying in the palm of the hand, are pressed upward and forward in the axis of the superior pelvic strait, slowly, persistently, gently, until the uterus responds and turns outside in. It is surprising how quickly, under proper manipulation, restoration of the inverted organ can be accomplished, the uterus often springing back through its own elasticity after the process is once started. Some writers state that, with the sudden return of the organ to position, a decided snap can be heard. Following reinversion, the hand should be left inside the cavity until uterine contractions can be established when it may be slowly withdrawn. The uterus should then be washed out with a hot, weak antiseptic solution, (iodine, lysol or carbolic acid), and if there is a tendency to relax, both uterus and vagina should be packed with sterile gauze. Ergot, as a promoter of uterine contractions, is preferable to pituitrin.

62 ADAMS AVENUE WEST.

The Present Status of the Treatment of Uterine Fibroids

By SOLOMON WIENER, M. D.,
New York.

There is no little confusion at the present time in the minds of practitioners, as well as of specialists, as to the indications and contraindications in the treatment of fibroid tumors of the uterus. This is a pity, because the methods of treatment at our disposal today, properly applied, are capable of brilliant results, and improperly applied may be fraught with failure or even disaster. Too many patients are told that their tumor may be treated by operation or by radiotherapy, and the choice is then left more or less to them. This is all wrong, because the indications and for radiation are different, and in the light of our present knowledge these indications are clearly and sharply defined.

In this paper no other conditions but distinct fibroid tumors of the uterus, fibromata or fibromyomata, will be included. The term radiotherapy will be used to apply equally to the use of x rays or of radium or its emanations.

In the first place, it should always be clearly borne in mind that a large proportion of all fibroids require no treatment whatsoever. All such tumors as are not giving rise to any symptoms, are not growing appreciably in size, and are not so situated as to cause a possible dystocia in a woman in the child-bearing age, can safely be left alone. When these conditions do not prevail and treatment is indicated, we have two methods at our disposal, radiotherapy and operation. No others need be considered. Treatment by any drug at our disposal is futile, and the use of endocrines, in the present state of our knowledge, is fanciful.

Let us consider radiotherapy first. This is often looked upon as the more conservative method of treatment, and yet as regards the ovary, which is a far more important organ than the uterus in the economy of the woman, it is absolutely radical. The doses of x ray or radium required to bring about the cessation of the symptom of bleeding alone, except in a woman at or close to the menopause, is equivalent in its action upon the ovary to a total castration. Thus, J. G. Clark, who has had a large experience with this work, says: "Radium is quite as potent in its power to bring on a premature menopause, and is quite as upsetting to the nervous equilibrium of a young woman, as the removal of the ovaries."

It is a mistake to consider the menopause as coincident with the cessation of menstruation. This is only one of its first and most striking symptoms. The normal menopause extends in the female, just as a similar process does in the male, over a period of many years. Indeed the atrophy of the ovary extends over a period of decades rather than months, and it is probable that its internal secretions play a part until senility. One cannot get away from the fact of the destructive action of radiation on ovarian substance and activity, for it is by this very action upon the ovary that the rays produce their effect on uterine fibroids. We hear a great deal of the so-

called specific and selective action of the rays on the fibroid tumor itself. This has never been proved, and we all know that the ovary and the testicle are among the most susceptible tissues of the body to radiation.

It is true that small sized tumors do apparently disappear under radiation. What has been largely forgotten is that in the early days of abdominal surgery, before the technic of hysterectomy had been sufficiently worked out to make it reasonably safe, fibroid tumors of the uterus were treated by surgical castration. This was in those days a much easier and safer operation than hysterectomy. In many instances it also succeeded in bringing about the shrinking or disappearance of small sized fibroids. When large tumors are radiated, even after all the symptoms to which they gave rise have disappeared, there remains a shrunken degenerated mass of tumor tissue. As some one has aptly put it, the living woman walks about a sarcophagus for her dead tumor.

CONTRAINDICATIONS TO RADIOTHERAPY.

The contraindications to the use of radiotherapy are definite and distinct.

1. *Age of the patient.*—The younger the woman the larger the dose of radium or x ray required to produce an effect, and the greater the destruction of ovarian tissue and functions. All authorities agree that this is not the treatment of choice in young women. Some put the lower limit of age for radiation at thirty-five and some at forty. After all, this is a relative matter, and if the case is one which is suitable for radiation, the patient herself should be permitted to decide whether she prefers to have her tumor removed and retain her ovaries, or have her ovaries destroyed and keep her tumor.

2. *Size of the tumor.*—Large tumors should, wherever possible, be removed surgically. At best, radiation results in a shrunken degenerated mass which may, and frequently does, give rise to subsequent symptoms, and which is more or less of a constant menace. This again is a relative matter. Many authorities do not advise radiating tumors larger than a three months' pregnancy in size. Some enthusiasts essay to treat tumors the size of a five, or even a six months' pregnancy.

The conclusions of the Mayo Clinic, as reported by Stacy, are as follows: "Surgery is still the treatment of choice for young women who have definite fibroids causing menorrhagia; for those who have a normal sized uterus but a history suggesting the presence of an intrauterine polyp, or a small submucous fibroid, and for those with a history suspicious of malignancy of the fundus of the uterus. We believe that large fibroids are best treated by hysterectomy as a certain means of quickly removing the tumor without the possibility of degenerative changes occurring later. It has been our policy to limit the use of radium to fibroids the size of a three and a half to four months' pregnancy, unless

there is a quite definite contraindication to operation."

3. *Tumors giving rise to pressure symptoms.*—The objections to radiating these are largely the same as under the last heading, only here there is a more general agreement that prompt operation is the better treatment.

4. *Inflammatory conditions of the annexa.*—It is coming to be a well recognized fact that in the presence of inflammation in the pelvis radiotherapy is fraught with grave danger, and is strictly contraindicated. Peritonitis and even death have ensued from the use of radium for fibroids in the presence of undiagnosed and unsuspected pyosalpinx. I myself know of an unreported case, vouched for by a prominent gynecologist of this city, in which peritonitis arising from an unsuspected pyosalpinx resulted fatally, in spite of prompt operation.

In discussing this subject Clark says: "The tumor must be uncomplicated with coincident inflammatory disease; it must be causing hemorrhage, and it must not be too large." He states that when pain is present, even without coincident evidences of inflammatory disturbance, it is seldom relieved, even though the tumor largely disappears. He mentions instances in which there was old salpingitis and a flare up of the quiescent process occurred. He has established a rigid rule that no patient suffering with pain lateral to the uterus is to be radiated. It is his practice to confine radiation to cases in which the tumors are the size of a three months' pregnancy or smaller.

In discussing Clark's paper, E. C. Samuel, of New Orleans, stated that he had had "three unhappy experiences" with a lighting up of infection after radium was used. In the same discussion Harold Bailey, of New York, said "that the mortality from radium treatment of fibromyoma, together with that of the undiagnosed and untreated complications, may be higher than one and a half to two per cent."

Stacy, in reporting upon the results obtained at the Mayo Clinic, concludes that radium should not be used where there is a clinical history or physical signs of pelvic infection, nor in those patients who complain of chronic pelvic pain, since the application of radium may light up a quiescent infection. They had three cases in which operation became necessary because of this untoward result.

In general, then, it may be definitely stated that in those cases in which there is pain, or above all fever, radiation is contraindicated. Clark goes so far as to state that pain rarely disappears after radiation, even with marked shrinking of the tumor. The difficulty of diagnosing latent infection will be dwelt upon later.

5. *Submucous and subperitoneal growths.*—Opinion is well nigh unanimous that these should not be radiated. Sloughing and necrosis of the tumors are almost bound to result from radiation.

6. *Ovarian tumors.*—Malignant ovarian tumors are prone to be, if anything, stimulated in their growth, and benign ovarian cysts may undergo malignant degeneration under radiotherapy.

7. *Carcinoma of the fundus.*—This form of cancer yields such uniformly excellent results after reasonably early operation, that no other form of therapy should be considered. Irregular bleeding is the

most prominent symptom of carcinoma of the fundus. No case of fibroids which has bled as a symptom should have treatment by radiation until a diagnostic curettage has been performed, the curettings examined, and carcinoma of the fundus ruled out. In a uterine cavity which is distorted by the presence of fibroid tumors the curette may miss the area involved in cancerous degeneration. Therefore at the Mayo Clinic hysterectomy is advised in those cases in which the history is suspicious of carcinoma of the fundus.

Martindale, an English enthusiast for radiation of fibroids, sums up as follows: "As long as one's diagnosis necessarily remains faulty, there is danger in using intensive x ray therapy for any but those cases in which we are fairly certain we are dealing with a straightforward uncomplicated case, e. g., a fibroid uterus well under the size of a six months' pregnancy, interstitial rather than subperitoneal, and in which the chief and only symptom is excessive menorrhagia. In such a case it seems to me the treatment *par excellence*. In all cases that are at all doubtful in diagnosis, I am certain that an exploratory laparotomy, followed by hysterectomy where necessary, is the only right treatment.

FREQUENCY OF COMPLICATIONS.

How often do complications which contraindicate radiation of fibroids occur?

Broun, in a study of 1,500 cases of myoma uteri operated in at the Woman's Hospital, New York, found that 355 cases (twenty-three and seven tenths per cent.) presented complications which contraindicated the use of x rays or radium. Almost one patient out of four who came for the relief of symptoms due to myomata had such complications. These included, for example, carcinoma of the ovary, papillomatous cyst of the ovary, abscess of the ovary, pyosalpinx, or similar conditions.

R. T. Frank, in a series of 419 unselected cases operated in the service of Brettauer at Mount Sinai Hospital, found that 140 (thirty-five per cent.) were complicated cases. Of these 140 complicated cases, at least seventy-four (eighteen and five tenths per cent.) presented conditions absolutely contraindicating radium. He stated, "Many of these conditions were not and could not be diagnosed before operation."

In a personal series of seventy-eight consecutive hysterectomies for fibroid, I encountered the single complication of double pyosalpinx seven times. These were old pyosalpinges associated with large fibroid tumors, and in no instance were they diagnosed before operation, though they were hospital cases and were examined by several members of the attending staff. Of course there were other complications in this series which I might enumerate, but the two large series of cases just quoted are sufficient to carry home the point.

The difficulty of diagnosing many of these complications is obvious. Large fibroid tumors dominate the clinical picture and the physical findings upon examination. Anyone familiar with bimanual examination will readily grasp the difficulty or impossibility of palpating small inflammatory annexal masses when the pelvis is filled with multiple fibroid tumors, or of differentiating, for example, a small

dermoid cyst of the ovary from an irregular mass of coexisting soft myomata. It may be exceedingly difficult or impossible to determine whether any of the fibroids are submucous in their development, or on the other hand whether any of the subperitoneal growths are pedunculated to such an extent that radiation would lead to necrosis and sloughing. It is sufficient merely to point out these difficulties, one need not emphasize them any further.

In view of all this, how can physicians diagnose large fibroid tumors and blithely send their patient to the radiotherapist? I myself feel a far graver sense of responsibility in advising radiation to any patient with fibroids, other than one in whom the tumors are small and pelvic conditions accurately diagnosed, than in advising operation.

INDICATIONS FOR RADIOTHERAPY.

Is radiotherapy, then, to be discarded in the treatment of fibroids? By no means, for there still remain a very considerable number of cases which constitute a legitimate field for its use. Indeed, it is only fair to state that radiation is today an indispensable part of our therapeutic armamentarium. It should be clearly borne in mind, however, that a diagnostic curettage is imperative preceding radiation whenever irregular bleeding is present.

Radiotherapy is the treatment of choice for all patients having organic disease sufficiently grave to render anesthesia and operation unduly hazardous. In these cases it is the treatment *par excellence* for stopping the bleeding. It should, of course, be used only where there are none of the pelvic complications which are in themselves contraindications. Radiation is also indicated in cases of very small uncomplicated fibroids where hemorrhage is the sole symptom, and the patient is approaching the menopause.

It is hardly feasible at present to set an arbitrary limit to the size of the tumors in which its use is to be recommended. Further trial and experience will be necessary to elucidate this point. However, it would not seem advisable to employ radiation for tumor masses larger than a three to four months' pregnancy in size, because of the difficulty of diagnosing complications.

Radiation is particularly advantageous in women approaching the menopause, because here the dose necessary to stop the bleeding need not be so large as to cause total atrophy of the ovary. The matter of the lower age limit at which to employ radiation is a knotty problem. Some investigators arbitrarily fix thirty-five years, others forty years, and so on. The age of beginning natural menopause varies within wide limits in different individuals. Certainly, raying ought never to be employed in younger women without definitely and explicitly explaining its effect upon the ovaries. It is my personal custom to tell every patient under forty years of age that the radium treatment of a fibroid is equivalent to castration.

Severe anemia is not of itself an indication for radiation. Here the treatment of choice is first transfusion and then operation. Some years ago I had a patient who after months of severe bleeding had a hemoglobin of twenty per cent. She had a

blood transfusion, followed in several days by hysterectomy, and made an uneventful recovery.

To sum up, while the class of cases in which radiation is the treatment to be preferred is limited, their actual number is by no means small.

OPERATIVE THERAPY.

What has surgery to offer us in the treatment of fibroids? In the first place, it takes care of the pelvic complications. Secondly, it is always conservative, at least of the ovary. Unless the ovaries are totally diseased, or the site of a neoplasm, they can be conserved.

In this connection it may be well to point out that it is not enough to leave the ovary *in situ*, its blood supply must be properly maintained. The ovary left without proper circulation atrophies. With adequate arterial supply and venous drainage it does not atrophy.

As to the uterus itself, operation may be radical or conservative, depending upon the location and relation of the growths. Myomectomy often conserves menstruation and sometimes makes future pregnancies possible. With improved technic myomectomy promises to be employed more and more in the future.

Hysterectomy may be total or supravaginal. Both myomectomy and hysterectomy may be performed by the abdominal or vaginal route, depending upon local conditions, and the technic at the disposal of the individual operator. In many instances vaginal myomectomy proves little more than a minor operation in its effect upon the patient.

As to the frequency in general of these various procedures, this is to a considerable extent a matter of choice with the individual operator. In order to illustrate to some extent their relative frequency, I have tabulated my own last one hundred operations for fibroids. Intrauterine polypi and small pedunculated or subperitoneal fibroids, removed incidental to other operations, are not included.

Abdominal supravaginal hysterectomy.....	59
Abdominal total hysterectomy.....	12
Vaginal hysterectomy	7
Abdominal myomectomy	14
Vaginal myomectomy	8
Total	100

There were eighty-five abdominal and fifteen vaginal operations; seventy-eight excisions of the uterus, and twenty-two excisions of the tumors only. In twenty-two per cent. of this series of cases it was possible to remove the neoplasm and leave the uterus intact. There is every reason to hope that the percentage of myomectomies will be steadily increased. There was one death in this series of cases, an abdominal supravaginal hysterectomy. A mortality of one per cent. for all the operations for fibroids, and of 1.26 per cent. for the hysterectomies (one out of seventy-eight hysterectomies).

Broun, in his series of 1,500 operations performed by a number of surgeons at the Woman's Hospital, reported a mortality of one and eight tenths per cent. In general the operative mortality varies between one and two per cent. These results are entirely comparable to those of the operation of interval appendectomy. Moreover, the operative re-

sults are burdened with such severe complications as necrosis and sloughing of the tumors, with more or less sepsis.

In the future, if cases with serious organic disease are palliated by treating with radiation, rather than attempting to cure by surgery, we may hope for even lower mortality statistics.

CONCLUSIONS.

1. Many fibroids require no treatment whatsoever.
2. Radiotherapy is a more radical method of treatment than operation because it destroys the ovary.
3. The contraindications to radiotherapy are youth of the patient, large tumors, pain as a symptom, inflammatory conditions of the annexa, submucous and subperitoneal pedunculated growths, ovarian tumors and carcinoma of the fundus.
4. Radiation should always be preceded by a diagnostic curettage.
5. Indications for radiation: As a palliative measure in patients with serious organic disease; small uncomplicated fibroids, where bleeding is the sole symptom, and the patient is approaching the menopause.
6. The indiscriminate use of radiotherapy in the

presence of unsuspected and undiagnosed complications will lead to a high mortality.

7. Surgery is the more conservative method of treatment, especially as regards the ovary.

8. Surgery takes care of the pelvic complications.

9. Myomectomy should be more frequently employed; it conserves the function of menstruation, and occasionally permits of future pregnancy.

10. Surgery has a mortality of from one per cent. to two per cent., including cases with severe complications—figures entirely comparable to those of the operation of internal appendectomy.

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67 WEST EIGHTY-NINTH STREET.

Unilateral Twin Tubal Pregnancy

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The extreme rarity of twin tubal gestation renders it interesting, and an added element of interest is present when, as in this case, the well advanced stage of the pregnancy is considered. Twin, or multiple, tubal pregnancy may be divided into three general types of groups: unilateral, in which there are two or more embryos in one tube; bilateral, or pregnancy of both tubes, and those cases in which tubal gestation accompanies an otherwise normal uterine gestation. The latter is not, strictly speaking, true twin tubal except when there are more than one embryo extrauterine. In my study of this subject only those cases in which there was a multiple pregnancy of one tube were considered.

Pool and Robbins (1) give an interesting review of the cases reported prior to 1910, including one of their own. Their study included twenty-nine authentic cases, with more or less complete data on each. They also mention the findings of Pulcher, McCalla, Schauta and Costa, who reported, respectively, eighteen, twenty-five, nineteen and eleven positive cases, although Costa considers fifteen other cases as presumably authentic unilateral twin tubal pregnancy.

J. F. Baldwin (2) reported a case which had been diagnosed as procidentia. Upon opening the abdomen there was found a twin pregnancy of one tube and a single embryo in the opposite tube. The embryos were very early, being about the size of peas. This case was reported in 1913.

Gordon Taylor (3) in 1918 reported finding one

complete embryo and part of another in a single gestation sac outside a ruptured right tube. Contrary to the rule, his case was in a young nullipara.

Noel Braham (4) reported a twin tubal pregnancy, with tubal abortion of one fetus, in 1914. In this case the patient gave a history of a six months' pregnancy, although the fetuses found measured but seven inches in length, and the fetus, which was extruded from the tube, showed signs of degeneration.

J. H. Carstens (5), of Detroit, had a case of triple tubal gestation in 1919. One of the features worthy of note was the finding of a single pregnancy of the right tube at about six weeks' development, while a twin pregnancy of the left tube was estimated as being that of three weeks. His patient also was a nullipara.

Of the cases reviewed there is one instance of multiple pregnancy of the tube in which there were five embryos of three or probably four months' development. This case was reported by Professor Treube (6) and verified by an anatomical specimen. Saenger (7), Krusen (8) and Barbat (9) each reported the occurrence of triple tubal gestation of one tube, or unilateral. The cases of Carstens and Baldwin were instances of bilateral tubal pregnancy.

Collating the data in these cases, it is found that the left tube is involved eight times to the right tube five, or almost twice as frequently. As to the duration of pregnancy, fifteen per cent. terminated before the middle of the second month. Twenty-five per

cent. reached three months or more. The remainder, or sixty per cent., terminated between the sixth and tenth weeks. For the same reason that ectopic pregnancy in general fails to develop beyond a certain period—except in rare instances—so must twin tubal pregnancy fail, because of the poor nourishment and the cramped surroundings afforded by its unnatural environment.

Of my case, the duration of which is estimated as being four months or more, a brief report is given.

CASE.—Mrs. N. S., hospital number 5439; white, female, married, aged twenty-nine. Family history: Parents living and well; one brother and two sisters, all in normal health. Personal history: Patient had had the usual diseases of childhood, but no other serious illness. Menstrual history: Patient began menstruating at the age of fourteen, periods regular, and of the twenty-eight day type, lasting four days; no unusual pain after the first day. Pregnancies: Patient is a parvипara, both children living and well; normal deliveries.

Present illness: After a siege of irregular menstruation for the past three or four months the patient was seized by a sudden attack of severe pain starting low down in the left side and becoming more general over the entire lower left abdominal quadrant. This was attended by faintness. She had menstruated normally five months ago. Of late there had been a periodical vaginal discharge of brownish, foul fluid, lasting two or three days. She had been constipated and easily nauseated during the past four months. Physical condition on admission to hospital: Brought



FIG. 1.—Fetuses removed in ruptured ectopic pregnancy of four months duration; actual length of fetuses six and a quarter inches.

to the hospital in ambulance in a condition of impending collapse; head, neck, chest and extremities normal; abdomen distended, more apparent on the left side. A bimanual examination showed the uterus to be enlarged and soft. A large mass, some six or seven inches in diameter, was present, lying to

the left and above the uterus. The mass was only slightly movable, firm in consistence, and seemingly attached to the uterus.

A diagnosis of ruptured ectopic pregnancy was made and hurried preparations were made for opera-



FIG. 2.—Schematic appearance of lower abdominal contents at time of operation.

tion. The operation was performed under gas ether anesthesia. Left parametrian incision was made for celiotomy. On opening the abdomen a considerable quantity of dark, clotted blood was found free in the peritoneal cavity. The right tube was normal, the uterus enlarged and soft. The left tube, which was enormously enlarged, was found to be ruptured, and the fetuses which it had contained were lying free within the abdominal cavity. The left tube, together with the products of conception, were removed and the toilet of the peritoneum looked after. The abdomen was closed, one cigarette drain being used. The patient made an uneventful recovery.

Examination of the specimen removed (which consisted of the two fetuses, the left tube, placenta, and membranes) showed two male fetuses of about four months' development. They were attached to a common placenta. The gestation sac and tube were found ruptured.

A photograph of the embryos and a schematic drawing of the abdomen and its contents give a very definite idea of the entire findings and their relations.

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A Brief Review of Recent Obstetrical Progress*

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I have thought it might be of some value to those of us who are interested in practical obstetrics, to go back over the past twenty-five years and see what can be pointed out as really progressive steps in this most important field. As an obstetrician, let me say at the outset that our specialty does not have a great deal to boast about, when compared with the rather remarkable progress seen in almost all other branches of medicine. I recently came across this quotation from an authentic source: "During the twenty-three years ending in 1913, in this country no definite decrease in the death rate from the diseases caused by pregnancy and confinement can be demonstrated; nor can any decrease in the death rate from puerperal septicemia be shown." Such a statement tends to give us a rather discouraging view of a field in which the general impression is, perhaps, that there has been great improvement during the past twenty-five years. Someone has called attention to the fact that we are loud in our praise of the wonderful attainments of modern medicine and surgery, but that we are silent on the lamentable deficiencies of everyday, practical obstetrics.

The science of obstetrics, and perhaps the practical part as done in the better class of institutions throughout the country, shows very decided gains in the last quarter of a century, but it must not be forgotten that by far the greater part of practical obstetrics is not yet done in suitably equipped institutions, or in institutions of any kind, and so long as this is true, the disparaging comparison with surgery and other specialties that are done in institutions, is not altogether a fair one. Do not misunderstand me, I am not offering the excuse of extenuating circumstances. The fact remains that we are away behind in the specialty of obstetrics, and that the medical profession, as well as the laity, is to blame for it, and all the more so if we pass it over lightly, without serious or concerted efforts toward improvement.

You Schuylkill County doctors may all do such good obstetrics that you are not ashamed of your mortality records, but down in Philadelphia, where we have long prided ourselves on being one of the great medical teaching centres of the country, we are ashamed to have to tell you that approximately one out of every 140 women who undertake the God given privilege and duty of motherhood, is made to sacrifice her life to our ignorance and inefficiency; and one out of every twenty-five babies born is added to the list of our infant mortality.

Statistics for the country at large show that among women of childbearing age, childbirth is second only to tuberculosis as the cause of the greatest number of deaths. In the past twenty-five years the mortality rate from many other causes, including surgical infection, tuberculosis, typhoid fever and other

epidemic diseases, has been greatly reduced, but our pride falls when we extend the survey to the field of obstetrics.

It is impossible, as you know, to obtain accurate maternity reports for the entire area of the United States, but, building conservatively upon the figures we have, it is estimated that at least twenty thousand mothers die annually in childbirth, or from its direct effects. Nearly half of this number die from puerperal infection—a disease which has been proved to be almost, if not wholly, preventable. A few years ago I carefully collected the available data on infant mortality for the United States, and found that on a most conservative estimate more than one hundred and fifty thousand babies die annually in this great enlightened land of ours, during the process of birth, or as a direct result of that process.

This is certainly an appallingly large annual death toll to be exacted by a function that is supposed to be physiological and normal. But this is not all, by any means. These tens of thousands of dead babies constitute something tangible that can be measured in the figures of mortality tables, but who can estimate the results of all the mental and physical defects of later life, that may and undoubtedly do come to thousands more who barely escape death at birth. And when to this frightful infant mortality and morbidity we add the well nigh incalculable maternal morbidity known to accompany and result from these births, then I am sure we are safe in saying that the domain of practical obstetrics offers one of the largest fields in all the realm of preventive medicine in which care is most urgently needed. Surely we must have higher standards of care for women in pregnancy and childbirth, and these higher standards can only come as we more generally recognize the seriousness of the need.

So much by way of introduction. Now let us look back over the past few years and see what we can pick out that is entitled to be called obstetrical progress. Undoubtedly there has been progress, great progress in some directions, and what is still more reassuring, the signs of the times all point toward a progressively increasing interest in obstetrics, with the promise of much more gratifying results in the near future.

Let us take first the period of pregnancy. While it is true that little progress has been made in the active treatment of the graver manifestations of the toxemia of pregnancy—eclampsia, for instance, still has no efficient, specific remedy—I think we have made very decided gain in recent years, in our efforts to prevent toxemia. Undoubtedly the greater attention to diet and to teaching pregnant women how to live are the most promising means at our command to prevent toxemia. By clearly recognizing and forcefully stating the dangers of overeating, or of vicious eating, and by carefully and systematically explaining to every pregnant woman just

*Résumé of an address at the Annual Outing of the Schuylkill County, Pa., Medical Society, August 4, 1921.

exactly how she may avoid these dangers, I feel that in my own practice I have made decided progress in the prevention of toxemia in recent years, and I hope I am having a reasonable degree of success in helping others to do as well.

I do not for a moment attempt to maintain that the cause of eclampsia is found primarily in the gastrointestinal tract, but the longer I practice obstetrics the more firmly I am convinced that in a large percentage of cases the digestive tract holds the balance of power, so to speak, in the struggle which is ever present in the pregnant woman between the toxins of pregnancy (whatever they are) and the specific protective cell ferments of her blood. Barring organic disease, if the intestinal canal can be kept normal and clean without purgation, and I believe it can, then the natural protective forces will maintain the ascendancy and there will be little or no evidence of the presence of a toxemia. At least that is the way I feel about it, and I feel it so strongly that I practically swear every woman who applies to me for attendance nowadays to follow my instructions absolutely, or to discontinue my services.

After explaining, and illustrating, if necessary, from case histories, the very real dangers from bad eating, I am in the habit of holding up my hand in front of the patient with thumb and fingers spread equally distant, while I tell her:

1. That her entire food allowance for the twenty-four hours is to be divided as nearly as possible into five equal portions (as represented by the fingers), one of which is to be taken every three hours until all are consumed; that no other food is to be taken after or before or between these portions, and that there is to be no big meal, and especially not the usual evening dinner.

2. That she may have a fairly liberal variety of foods, so long as they are known to be nutritious and digestible, and that her drink is to be limited almost entirely to milk and water.

3. That as often as she eats, or five times a day, she is to take at least a half teaspoonful of bicarbonate of soda, or its equivalent in some other alkali, such as the milk of magnesia; that this is to be increased or decreased according to its effects on the reaction of the urine, and the general condition of the patient.

Of course, much more than this and much that is different must often be said to suit individual cases, but this is the gist of the matter. The method outlined is the most effective I have ever found to prevent overeating. A small meal of simple, nourishing food every three hours is digested and assimilated, and the plan therefore works no hardship to the bodily needs. It runs counter, however, to a long established custom that is hard to break in some instances, and calls for a degree of moral courage and self-sacrifice not possessed by every woman.

The second progressive step to which I would call attention is that of the greater attention being paid to obstetrical diagnosis. In my earlier obstetrical experience I saw many cases of serious, and often fatal injuries to both mother and child, which I know were due to the failure of the attendant to

make a careful diagnosis of the exact relationship in presentation, position, and size of the child and the birth canal. Recent years have shown decided advancement in this direction, and a consequent material gain in the conduct of labor. Take for illustration the persistent occipitoposterior position. It has been my experience, as I suppose it is the experience of every consulting obstetrician, to see a large number of cases of this kind, and to see serious results from their having remained too long unrecognized. Some years ago I found, in looking over my records, that practically one out of every four cases in which I had been called to assist the family doctor in delivery, proved to be an occipitoposterior position, and usually unrecognized. In thirty-six per cent. of these cases, failure to make a diagnosis had led the doctor to make one or more unsuccessful attempts at forceps delivery, with its usual disastrous results. DeLee is of the opinion that more children are lost from occipitoposterior position than from contracted pelvis, and my experience would lead me to believe that he is correct. I have found dead babies in sixteen and two thirds per cent. of the cases where these unsuccessful attempts had been made. And the sad part of the story is, that a proper diagnosis and the application of what I have called trimanual rotation would have saved practically all of these babies and greatly reduced the maternal morbidity. I am satisfied there has been real progress in this matter of diagnosis, but there is still room for improvement. Only three days ago I saw a case where the attending physician had exhausted his strength in repeated unsuccessful forceps attempts on an unrecognized occipitoposterior presentation. To my great surprise, the fetal heart could still be heard, though very feebly. A trimanual rotation made the delivery easy, but I seriously question whether that child will ever entirely recover from the unnecessary injuries it had sustained.

This leads to my third point, namely, the discovery and systematic use of the labor stethoscope. I have not a doubt that the attention thus given to the condition of the child during labor has resulted in a decided reduction of birth mortality. A few years ago one seldom or never saw a stethoscope used in labor, and but little effort was made to keep track of the effects of labor upon the child. Now, no careful obstetrician would think of conducting a difficult or an instrumental delivery without frequently listening to the fetal heart sounds, and being governed largely by what was thus revealed. Various instruments have been devised. Most of us, perhaps, are familiar with the efficient, but somewhat cumbersome head stethoscope of DeLee; I find this is used but little outside of Chicago. The simple little metallic cone which is sterilizable with the other instruments, is always ready, and is easily and safely used, is in my opinion the best all around practical labor stethoscope in use today.

I scarcely need mention, as a fourth step in comparatively recent obstetrical progress, the almost universal use of rubber gloves. While of incalculable value in itself, the rubber glove has made practicable another procedure of even greater importance in many respects, namely, the practice of rectal

examinations in labor. Repeated vaginal examinations, with all their potential dangers, have been practically eliminated from modern obstetrics. My own records for the past five years show that less than five per cent. of my patients have had any vaginal examination before delivery. The consequent saving in maternal morbidity, to say nothing of the item of time saving to the doctor, has so impressed me with the value of this method that I would not give it up under any consideration. One institution where rectal examination is the rule, reports over four thousand deliveries with only two cases of infection, and in these the patients had both been examined vaginally. Similar reports of greatly reduced morbidity are found wherever vaginal examinations have been discontinued. This is certainly a great forward step in practical obstetrics.

In the matter of the prevention and treatment of asphyxia neonatorum, there has likewise been decided progress in recent years. As to the early detection or prevention of asphyxia, the advent of the labor stethoscope, as previously noted, has been of the greatest importance and has undoubtedly saved many lives. In the treatment of asphyxiated babies, most of us whose experience goes back more than fifteen or twenty years will recall how carefully we were taught some half a dozen more or less complicated methods of resuscitation, such as the various swingings, slappings, tongue pullings, hot and cold water dippings, and other methods of reflex stimulation; all of which we look upon now as having been of questionable value if not in most instances a useless waste of time and a positive menace to the welfare of the child. In my practice I use an aspirator, which I consider the greatest little baby saver yet devised, and has made the crude methods I have mentioned well nigh obsolete. I say this without fear of contradiction, for it has been demonstrated and proved in thousands of cases. This aspirator is all that is needed, except in asphyxia pallida, where in addition to clearing the respiratory tract some form of mechanical resuscitator, such as the infant lung motor, is almost a necessity to save life.

There are other progressive steps in the immediate attentions to the newborn, such as the greatly improved methods of caring for the cord; and in the conduct of the puerperium, where the discontinuance of all purgatives and the institution of proper methods of feeding have given such good results, but the limitations of space prevent more than a mere mention of them.

The use of pituitary extract is another development of more recent years, that has real value as well as real danger. I would not care to be without this agent in the third stage of labor, where its routine use is a helpful and blood saving procedure. I also find it a valuable aid in the induction of labor, but seldom use it except for one of these two purposes, and therefore feel that I use it safely.

As a final point in this hurried review, I have been requested to say something on the latest, and what I believe to be by far the most important step in modern obstetrical progress, namely, the so-called prophylactic conduct of labor. DeLee uses the term prophylactic forceps delivery, but prophylactic con-

duct of labor includes far more than the mere use of forceps.

Throughout the obstetrical world today, there is a definite move toward the recognition of the fact that the delivery of women in childbirth, in all except the easiest of cases, is no longer a normal function, but purely a surgical process and should be accorded the same careful consideration that is given to other surgical procedures. The efforts everywhere being made to reduce the time and amount of suffering, and to conserve the maternal energies in labor, constitute the most far-reaching and beneficent move in the obstetrical world today. The *dammerschlaff* fad of a few years ago might be considered the beginning of this movement. The notable work of Potter, of Buffalo, is in the same direction. As I see it, it is not the fact that Dr. Potter is wonderfully clever in doing versions, but that he is superlatively humane in substituting at the earliest possible moment the obstetrician's definite skill and art, for perverted Nature's prolonged uncertain and doubtful process. It is this, in my opinion, that makes his work remarkable, and brings to him annually so many hundreds of grateful women.

DeLee and his associates in the Chicago Lying-In Hospital accomplish the same thing by means of early, or prophylactic forceps delivery. Many others throughout the country are working on the same problem—how to terminate labor at the earliest possible moment consistent with the least amount of injury to mother and child. The means of delivery, whether by podalic version, prophylactic forceps, or other procedure, is largely a matter of individual preference and skill, and is of far less importance than the fact of early, painless delivery.

How different is all this from the teachings of the past, when it was considered the sacred privilege of woman to suffer to the full extent of her physical and mental endurance, just because labor had always been called a normal, physiological function. And yet perhaps it was not wholly because of this fact. I suspect that it was in part, at least, because our knowledge and skill in the art of obstetrics had not yet reached the stage of development that would justify the present day procedures. I am a staunch believer in evolution—the evolution of knowledge and skill, and as modern civilization, with all its complexity of life, more and more incapacitates woman for normal childbirth, the art of obstetrical surgery is developed to meet the new demands.

Now, before going further, I wish to say definitely that I do not teach or believe that the method of delivery I am about to describe is practical for the family physician, who is still obliged to do his obstetrical work outside of institutions and without suitable facilities and adequate help.

It has been well said that "under the conditions in which the large majority of babies are born today, watchful expectancy and natural delivery will undoubtedly give the best results." Please do not misunderstand me, therefore, when I describe a method that to most doctors must long remain ideal, rather than practical. That the time will some day come, however, when enough suitable institutions throughout the land will permit the more general realization

of our obstetrical ideals, is a hope to be devoutly cherished.

SUMMARY.

Those of us who practise the prophylactic conduct of labor aim to secure our results in the following manner: 1. By the use of morphine and scopolamine in sufficient quantity to lessen the severity and usually the length of the first stage of labor. 2. By terminating labor artificially as soon as the first stage is completed by the natural forces; or as soon as it is evident that the natural forces have failed to complete it. This is done by giving an anesthetic, applying forceps, bringing down the head (if it is not already on the pelvic floor), doing a good, free, perineotomy (preferably, lateral oblique) and at once delivering the child. 3. The moment the head is born, an ampoule of pituitrin is given intramuscularly. By the time the child is ready to be handed over to the nurse, the uterus is ready to expel the placenta, either with or without assistance. This is followed immediately by an intramuscular dose of ergot, and a hypodermic injection of morphine and atropine. 4. The perineotomy wound is now closed by three or four rows of buried sutures, the last of

which is a subcutaneous silkworm gut. Great care and skill are required for the proper closing of this wound, as well as for its making, but the gratifying results will amply repay for the time and care thus given. The method of giving the pituitrin and ergot shortens the third stage, saves blood, and with the morphine makes little more anesthetic necessary for the wound closure.

Delivery thus accomplished robs labor of its chief terrors, and leaves the patient unafraid of a future pregnancy. Only a few weeks ago I delivered a young woman by this method, for the second time in eleven months. It saves the pelvic floor, removes the dangers of prolonged compression to the baby's brain, and decidedly shortens the period of convalescence.

A further summary of the great advantages of this method of delivery is not now feasible. Suffice it to say that, in my own experience at least, these advantages have been so evident, and so entirely satisfactory to both doctor and patient, that neither of us would be willing to go back to the good old fashioned natural way.

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Practical Prenatal Care*

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Perhaps the greatest advance made in the science of obstetrics, since the time when Semmelweiss and Holmes impressed upon the profession the importance of aseptic technic, is that of thorough practical prenatal care. Just as asepsis has saved thousands of mothers from the fire of puerperal fevers, so prenatal care will protect them from the no less horrible eclamptic convulsions and toxemias of pregnancy, as well as from the useless protracted suffering incurred, in an effort to push a fetal head through an impossible pelvis.

It is only the realization of the vast importance of prenatal care that gives me sufficient courage to present a paper on a subject that has received such thorough consideration during recent years by the lay public and at the meetings of nearly every medical society in the country. The very fact that prenatal care has been so persistently and continuously discussed by the profession, seems to indicate its great importance to us and to future generations. Until lately, prenatal observations were conspicuous by their absence, perhaps because the expectant mother is ever in our midst, and for that reason is improperly appreciated. Schwarz tells us that nine tenths of the women in the United States receive no prenatal care. The average obstetrician thinks it more important to know the technic of applying forceps and of doing a Cæsarean section than to acquaint himself with the simple rules of prenatal hygiene. Semmelweiss and his

assistants, in advocating asepsis, at least had the advantage of novelty in proposing something new, whereas those who urge prenatal care are deprived even of that privilege, for care of the expectant mother has been practised in some form even by primitive races who have left evidences of specially constructed rest lodges where the pregnant woman could lie down.

The laxity of prenatal care is due to the fact that the laity, and some physicians, are not aware that gestation in most women of the present day is not a purely physiological process, and that motherhood exacts a most severe test of women's physical and nervous makeup.

How difficult it is to instruct expectant mothers, particularly multiparæ in prenatal care, all of us fully realize. When a woman has had several children without any mishap, with no other prenatal attention than a vaginal examination and a single uranalysis, it is no easy matter to induce her to visit you frequently and regularly. Yet, if we all made it a practise to urge, even insist, that they come back regularly, impressing upon them the necessity of it, this problem would be solved. We can still bring to bear further inducement by mentioning the fact that there is no additional fee for this service, and that if they find it absolutely inconvenient to visit at your office you would be willing to call at their home. Make them realize your earnestness in the matter and you will almost invariably gain them to your side. With primiparæ

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you have a much easier task. They seem to appreciate the necessity of being looked after, and if you fail to have them return for further attention they will go to someone who does examine their urine and blood pressure, leaving you to wonder why she did not call you when she was delivered.

Once having obtained your patient's cooperation, you will find prenatal care far less a burden than you imagine. I begin with a routine examination, going into the previous history of the patient as to scarlet fever, rheumatism, rickets, and vaginal discharges and character of previous labors, if any; then follow into the present history, laying particular stress upon the question of headache, spots before the eyes, bleeding, constipation, sleep, heartburn, edema of extremities, and epigastric pain. This is frequently sufficient to put you on your guard against unexpected difficulties.

Pelvimetry, an art that has been neglected by the majority of physicians, particularly those who take cases occasionally in order to be on good terms with their old patients, and those physicians who neglected this procedure when they first started to practise, and, fortunately for them, did not find it in any way a hindrance to their success, is really of vast importance and can no longer be overlooked.

The measurements should be taken in every primigravida and also in all multiparous women where a history of difficult labor is obtained. This can be accomplished in as little time as taking a blood pressure reading. By this means you will at an early date be able to anticipate obstacles to delivery and so conduct your case as to protect the mother and child from unnecessary trial later, and save yourself from an embarrassing position. I recall a case where a physician was watching and waiting for a head to enter into a funnel shaped pelvis with an external conjugate of sixteen cm. After permitting the woman to suffer for five days, he finally decided that something ought to be done. Had he taken the pelvic measurements, he would have realized that the patient should not be delivered at home.

Following the measurements, an abdominal examination is then made to ascertain the following: First, diagnose pregnancy, cases of pseudocyesis are not as rare a condition as we are ordinarily led to believe. The position of the child and fetal heart is of next importance. The examination is completed by a blood pressure reading, uranalysis, and examination of the heart and lungs of the patient. Of how much greater service are we to our patient when we detect at an early date an active tuberculosis and terminate pregnancy in time to save the patient's life, or recognize a cardiac condition and so direct the expectant mother as to enable her to husband her strength for the crucial test. In cases of cardiac disease where the myocardium is laboring under the added strain, ten mm. of tincture of digitalis given throughout pregnancy will often be enough to tide the patient over the emergency which otherwise might have been disastrous. To have a woman in the first stage of labor with pulmonary edema due to a loss of compensation during time of labor is not an infrequent occurrence in hospital practice where patients are sent when it is felt that

they are beyond any hope of recovery. In these cases the administration of the digitalis in time would have saved two lives.

As to the importance of routine urine examination, little need be said, because it is so generally appreciated. It not only informs one of the present condition of the patient's health with its impending danger, but treatment can be instituted at once and a catastrophe avoided. Two microscopical examinations should be made for each patient, one when she is first seen, and the other after a two months' interval. While albumin in the urine is of utmost importance, yet its absence without a microscopical examination cannot exclude a pathological kidney condition. Those of us who have not a microscope nor the time for such an examination at the office can make some arrangement with the nearest laboratory to have the work done. Finally, I would lay particular stress upon the significance of blood pressure reading. Were I to have the choice of uranalysis, stethoscope or blood pressure apparatus in the care of a patient, I would unhesitatingly choose the latter. It is our most valuable adjunct, because with its knowledge we can ascertain any impending danger much sooner. Readings should be taken every time the patient comes to your office, or whenever you visit the patient at her home. The reading may vary within a week and give you prompt notice to begin treatment. A rise of twenty to forty mm. should cause serious concern. While it is true that certain forms of eclampsia are ushered in with low pressure, yet a majority of cases have high blood pressure.

The information so far obtained enables you to prevent gross misfortune. It is further necessary so to advise the mother in her personal hygiene as to assist you rationally in keeping her healthy. Pregnancy has been defined as a disease of nine months' duration, and when we consider the change that takes place in the entire female organism it is no wonder that it is so interpreted. We must conscientiously attempt to counteract these deleterious forces. The patient's bathing, clothing, diet, bowels, teeth, breasts, exercise, rest and sexual relationship must all be attended to.

The question of bathing is still surrounded by a mist of tradition. The prohibiting of bathing during the eighth month, because the baby is weaker in the eighth month than in the seventh, and if prematurely born in the eighth month cannot survive, while if born in the seventh month is more likely to live, is all nothing more than a grandmother's yarn. She should bathe four or five times a week in lukewarm water with soap during each month of the pregnancy.

The clothing should be free from constriction at the waist or extremities, and should be suspended from the shoulders. Proper protection from cold should be secured, and this can hardly be obtained by the wearing of short skirts and silk stockings. The diet should be simple, wholesome, and in harmony with the tastes of the patient. The character of the diet will necessarily depend upon the urine examination and pelvimetry results. If the urine is abnormal, withhold spices and other renal irritants. If the pelvis is small or the baby in your estimation too large, avoid carbohydrates and de-

pend more on the proteins to reduce the weight of the child. In cases of constipation, laxative fruits associated with milk of magnesia or cascara preparations yield excellent results. In renal conditions, salts are advisable, in that they best assist elimination of toxins.

The teeth of the expectant mother are so frequently affected that a little attention will give gratifying results. The aphorism, a tooth for every child, expresses the condition fully. The use of the toothbrush and an occasional wash with milk of magnesia may be sufficient. In more progressive cases calcium should be prescribed as a drug or as a food through the use of milk, and a dentist consulted. Extractions under general anesthetics or too extensive work on the teeth should be avoided, though I see no contraindications to local anesthetics.

In relation to exercise, our patients differ from those ordinarily described in the textbooks. They need not be warned against horseback riding nor midnight dances, nor need they be advised to indulge in any form of gymnastics, for caring for the house affords them ample exertion. What they need is fresh air, and they should be urged to walk every day, of course not to the extent of overexertion, as was the case of an expectant mother who would walk daily until she felt faint, because she had been told that walking would make labor easier for her. That idea unfortunately is common not only among the laity but also the medical profession, and is difficult to combat because of its old tradition. One can readily appreciate that the future mother is already maintaining a high metabolic balance, and that great exertion means increased metabolism with greater strain on the kidneys. The heart, too, is being taxed to its fullest capacity, and undergoes a physiological hypertrophy. Rest is important, and a diversion like the cinema, when not too emotional or crowded, is desirable.

The breasts and nipples need care. They should be washed with castile soap and a fifty per cent. solution of alcohol applied every night. A comfort-

able binder is sometimes of great help. Depressed nipples should be gently massaged and drawn out. Finally, it should be explained to the patient that sexual relations should be avoided in the last three months. Anticipate this question, because it is frequently not asked.

The dangerous signs of toxemia must be impressed emphatically. Tell the patient to call whenever she experiences any of the cardinal symptoms of eclampsia; that is, headaches, spots before the eyes, edema, epigastric pain, suppression of urine, obstinate constipation, sleeplessness, and heartburn.

In this manner you will safeguard your patient, protect your practice, and obviate the necessity of lay organizations taking over prenatal care.

The objection that the physician who does the prenatal work is occasionally not called in for delivery is not really valid, because all of us lose nearly ten per cent. of our cases engaged and get ten per cent. of those belonging to some other physician for delivery, thus equalizing the results.

It is not my intention to bore you with statistics of the fatalities that occur daily from the neglect of practical prenatal care, yet to give you an idea I will mention briefly the following: Callie, of Toronto, states that the death of every child that is stillborn, where no other cause can be found than eclampsia or prenatal toxemia or syphilis, is the direct fault of the physician. Of 146 stillbirths, thirty-seven, or twenty-five per cent., could have been saved by prenatal care. Clifton Edgar, out of five hundred stillbirths, estimated that at least one hundred of them might have been prevented by more adequate prenatal care. Out of every hundred women in whom eclampsia or some form of prenatal toxemia develops, eighty-five die.

In conclusion, let me remind you that none of the suggestions lie beyond the scope of any of us, and that a conscientious application of prenatal care will save both the expectant mother and her baby, and ourselves from the disaster that accompanies neglect.

1457 UNION STREET.

Accidents During Delivery*

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Under the heading accidents during delivery I wish to discuss a few points, some of which might perhaps better be called difficulties rather than accidents during delivery.

The first subject is that of hemorrhage due to deep cervical lacerations which involve one or more of the large branches of the uterine artery. The etiology of such lacerations is usually insufficient cervical dilatation due either to inelasticity of the deep cervical tissues or to a precipitate labor or both. Precipitate labor may be due to a state of hypercontractility of the uterine muscle, or to the injudicious use of pituitrin. A too hasty forceps delivery may also produce the same damage. The

following case illustrates the grave nature of some of these lacerations:

CASE I.—Mrs. C., primipara, aged forty-one, went into labor at 11 p. m., March 4th, and was admitted to the Samaritan Hospital at 1 a. m., March 5, 1920. An examination disclosed the fetus in the R. O. A. position. The maternal measurements were normal. The patient had felt well during her pregnancy, although since the sixth month she had had a high blood pressure and albuminuria. At 9.30 a. m., after ten and a half hours of strong uterine contractions, the cervix was apparently well dilated and, to hasten delivery, the membranes were ruptured. The fetal head was well engaged and had descended to midway between the inlet and the

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pelvic floor with partial rotation. After waiting two and a half hours, at which time the mother and fetus were beginning to show signs of exhaustion, little progress having been made, it was decided to terminate delivery instrumentally. Forceps were applied and, after a somewhat tedious use of these instruments, a normal sized, exhausted, male child was delivered. It required considerable manipulation of the baby to produce a cry.

After the extraction of the baby there appeared at the vulvar outlet a gush of blood which persisted and in a short time, a few seconds, assumed alarming proportions. Bimanual examination revealed the uterus well contracted and a deep tear in the right side of the cervix running well up into the right vaginal fornix, also a second degree tear of the perineum. Before sutures could be applied to the cervical laceration, from whence the profuse bleeding was coming, the patient had lost a large quantity of blood. After the hemorrhage was controlled and the placenta delivered, the patient was taken to her room in a greatly weakened condition. Two hours later she went into shock but responded readily to hypodermoclysis and enteroclysis.

The baby, after resuscitation, was placed in bed, well protected with covers and hot water bottles, but when examined after the mother had been taken care of was found to be dead. The mother's condition, after resuscitation from shock, remained satisfactory until the third day, when acute dilatation of the stomach developed, and, in spite of all efforts to relieve her, she died on the eighth day after delivery. In reflecting over this case it seems quite probable that the predisposing cause of death of the mother was hemorrhage, and the exciting cause infection, which her lowered vitality prevented her from successfully combating. The child undoubtedly died from exhaustion.

Edgar defines an elderly primipara as one who is thirty years of age and upward, and states that labor in such women is but slightly longer than in primipara in general. He cites a series of forty-seven cases with no maternal or fetal mortality, in whom thirty delivered themselves spontaneously, seventeen requiring instruments. Four patients of the series had postpartum hemorrhage. He also states that lacerations are more frequent in elderly primipara.

I cannot but feel that a Cæsarean section in the case above reported would undoubtedly have saved both the mother and child, yet, aside from the age of the patient, which is not admitted as a reason, there was no classical indication for such procedure.

Rupture of the uterus is perhaps the most serious accident with which the obstetrician has to deal. Uterine and pelvic pathology sufficient even to suggest such condition should be recognized sufficiently in advance to subject these patients to such form of delivery as will safeguard them against this emergency.

We should not lose sight of the fact that a patient once subjected to Cæsarean section should, in all subsequent deliveries, at least be carefully watched if not delivered by section. Dr. J. C. Applegate tells me that he knows personally of three cases of ruptured uterus following attempts at natural delivery

in women previously delivered by section, the ruptures occurring at the sites of the incision scars. Patients who have had good union of the uterine wall following the Cæsarean operation will probably deliver themselves, provided there is no disproportion. Safe delivery depends, however, on good union and of this we cannot be certain. Where it is intended to allow such a woman to attempt to deliver herself she should be in a hospital where she can have immediate surgical attention should rupture occur.

Podalic version is a relatively frequent cause of uterine rupture, and this is one of the strong points in argument against the general use of podalic version as a means of lessening the pangs of childbirth.

Again, the employment of too large doses of pituitrin has undoubtedly caused the rupture of many uteri. I know of one such case that followed the hypodermic administration of one c. c. of this drug to a patient who was already having strong contractions.

Intracranial hemorrhage due to pressure on the fetal head during delivery is not, of course, usually manifest at that time. Excessive uterine stimulation due to the use of large doses of pituitrin, following the introduction of this drug as an oxytocic, may have been the cause of many cases of intracranial hemorrhage. At the present time, however, with a better knowledge of the action of pituitrin, the dangers in its use should be minimized.

The too early application of forceps, before moulding has taken place, may so traumatize the fetal head as to cause intracranial hemorrhage. On the other hand, delay in the second stage of labor, with long continued pressure on the fetal head, may be equally dangerous. In such cases of delay the early use of forceps should be practised in the interests of both mother and child. Where it is evident that the fetal head cannot be delivered without undue pressure against the maternal soft parts, with danger also of serious injury to these parts by hastening delivery, episiotomy should be done to facilitate delivery. The necessity for episiotomy, however, is not altogether frequent.

Asphyxia of the child due to pressure on the cord caused by one or more loops of cord tightly encircling the neck and becoming tighter as the head advances, is sometimes met with. One fetal death due to this cause occurred in my practice some years ago in a multipara forty-five years of age who was especially desirous of having another child. It is a condition difficult to foresee, and only emphasizes the necessity of keeping a close watch as to the character of the fetal heart sounds and being prepared to terminate labor quickly should there be signs that the child is in danger. The method of dealing with such cords after the head is born, and pressure has not been sufficient to cause asphyxiation, is a comparatively simple matter. It is those cords which cannot be reached that give rise occasionally to a fetal death unless the stethoscope has detected the danger sign.

There are many accidents due to faulty presentations, the consideration of which would open up too broad a field to come within the scope of this paper.

167 HARVEY STREET.

Difficulties Encountered in Pregnancy, Labor and Lactation in Working Class Mothers and Those of the Educated Classes*

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London,

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In my experience, the upper classes regard pregnancy as a period during which discomforts are to be expected and it is only rarely that complaints are made of the minor unpleasantness associated with this condition. Probably this is in great part due to their education and to the fact that their mothers and married friends can give information and advice as to what they themselves noticed and what treatment they employed. In part also it is due to a natural reserve and shyness of discussing these minor matters with their medical attendant. Further, they realize the importance of attending to their general health, keeping their bowels regular and other details which make for a comfortable gestation period. Vomiting and other manifestations of toxemia of pregnancy are, I think, less common among them than in the lower classes; this being probably in great part due to regular exercise, greater care in diet and the satisfactory regulation of the excretions. Again the latter point militates against the occurrence of hemorrhoids, so common in the lower classes. The wearing of suspenders, instead of garters (frequently in the poor taking the form of a boot lace or a piece of tape) helps to prevent the formation of varicose veins. The wearing of a well fitting corset supports the uterus and relieves the heavy feeling from which pregnant women suffer. Lastly, the control of too rapid childbearing allows of recovery of the overstretched tissues so that pendulous abdomen and prolapse are less common. Among the lower classes, complaints are more common. They have no one else to advise them, they do not mind questioning a doctor about their symptoms, and they do not take care of themselves.

One is often asked whether work and healthy vigorous exercise are bad for pregnant women. I am convinced that no work or physical exercise which can be comfortably carried out can do any harm to a pregnant woman, but on the other hand will do good, in that it will make her physically fit to go through the muscular strain of labor. The expectant mother, who has spent her pregnancy largely on the sofa or in bed (now fortunately very rare), naturally is quite unfitted for this strain and will have a long and exhausting labor. It has been shown by various observers that a diet poor in carbohydrates and fluids exerts considerable influence in lessening the weight of the child without otherwise affecting it and dieting during pregnancy along these lines has been tried in the treatment of minor degrees of pelvic contraction or where larger babies have previously been born.

Labor is regarded by the upper classes as an event terminating nine months of discomfort and is not

looked forward to with fear. This is especially so if the patient has confidence in her medical attendant and this confidence can usually be attained. It is, I am convinced, extremely important that conversations should be held between the expectant mother and the physician, when the symptoms, pains and progress of labor should be fully described and the treatment foreshadowed. The knowledge of what may be expected is extremely beneficial to the mother, who often finds the actual labor to be not so bad as she had anticipated. The fear of labor impressed on her from early girlhood can be banished by judicious lecturing. As a result, with few exceptions, the early stages of labor are extremely well borne, especially if attended by a thoughtful and sympathetic nurse; the mother making no complaints to doctor or nurse and often employing herself in household duties.

When the time for delivery approaches, a demand for an anesthetic is usually made, provided it has not already been administered; the mother realizes that the pain is becoming greater than she can bear and that if no help is given she will disgrace herself by screaming. Further, education has taught her that the actual birth of the baby and of the placenta is unpleasant and associated with bleeding. This is naturally very distasteful to a sensitive woman and one often meets patients who complain bitterly about the management of a former labor, in that they were allowed to see "all that was going on": this being impressed on her mind even more than the pain. The dislike, even fear, of seeing blood, is almost universal, save in those who have passed through a certain period of training as a nurse.

Among the lower classes there is a greater variation. In a number of cases little notice is taken of labor from start to finish, but much more often the patient is noisy and groans loudly or screams during the pains. She does not look upon labor as a relief but rather as a torture. She has not been taught to control, but rather to give way to her emotion; witness the noisy laughter of the exuberant coster girls on bank holidays. The demand for an anesthetic, unless one has been administered in a previous labor, is infrequent here, however, and the stage at which the patient can and will stand no more does not exist in this class; they do not realize their limitations. The unpleasantness of the delivery of the baby and placenta has not occurred to them, they are used to such things. Blood does not alarm them; very often their work is of a dirty nature and frequently they assist at other confinements.

Do the upper classes have more difficult labors than the lower? I think that in the upper classes the babies as a whole tend to be larger, there is less variation; but the largest babies I have seen

*Read at the Infant Welfare Conference held in London, July 7, 1921.

have been in the lower classes. Deformity of the pelvis is almost unknown among the upper classes. The desire of the medical men to hasten delivery to save the patient pain often results in lacerations which would not otherwise occur. The administration of an anesthetic makes postpartum hemorrhage more frequent. Actually, I think, minor difficulties are more common among the upper classes, while major difficulties are extremely rare.

It is when one comes to the subject of nursing that one meets the greatest variation. The desire to nurse the baby is increasing among mothers of all classes and women who refuse to do so are fortunately rare. The capability to do so, however, is much less frequent among the upper, than among the lower classes. Among the lower classes the advent of milk secretion is usually between the thirty-sixth and forty-eighth hour after delivery, and it is therefore only very rarely necessary to feed the infant before the mother has a sufficiency of milk to do so herself. Among the upper classes the flow of milk rarely commences before and often not until seventy-two or even eighty-four hours of delivery. This may necessitate the giving of a bottle before breast feeding becomes possible. To meet with a mother of the lower class who is unable to nurse her baby at all for want of milk, is a rarity I have never seen. In a much smaller number of cases, I have met with two such in higher social life. In one case no milk was secreted and the same condition had been present in a preceding pregnancy; in the other there was an insufficient quantity, the

baby never obtaining more than two drams of milk at a feeding, in spite of all efforts to increase the supply. Both of these mothers were desirous of nursing the infants. Among the upper classes the strain of nursing appears to be greater and many women become incapable of suckling after getting up. Social duties interfere, even when four hourly feeding is established, and this is a not infrequent cause of weaning. Among the lower classes inability to continue nursing is much less frequent. In fact, one often finds cases in which nursing is continued for twelve or even fifteen months after delivery; this being done with the idea of preventing a future pregnancy. It is generally held among this class that nursing renders pregnancy impossible. This, however, is not true. Further, the supply of milk among the lower classes is usually considerable and is often in excess of the needs of the infant. Where the supply is deficient one can often in this class increase it by supplying the mother with extra milk and extra food, and it is only rarely in this class that one has to substitute a bottle for breast feeding on account of insufficiency of secretion. Why this great difference should exist between the two classes of social life with regard to the supply of milk it is difficult to understand. The maternal instinct is, I am sure, not less marked, sometimes more marked in the upper than in the lower classes. The upper classes are naturally well fed and as has already been said take better care of themselves than do the lower classes. Yet their value as nursing mothers is far less.

The Antenatal Factors of Life and Death—Genetic, Toxigenetic, Gestational and Obstetrical*

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The outstanding statistical fact of infant mortality during the last decade in Great Britain is the practical suppression of summer diarrhea. This statement is also largely true of the United States. In Great Britain the last epidemic of summer diarrhea was in 1911. In recent years, the combination of high temperature and low rainfall, when occurring in the third quarter, has no longer been associated with epidemics. I have frequently discussed this fact, the most striking illustration of which is the figure for the third quarter of 1920, sixty-five, the lowest ever recorded in this country in any quarter of any year; and here I merely observe that the disappearance of summer diarrhea leaves us with a problem of infant mortality, which is different in form from that of twenty years ago, about one third smaller in bulk, but much more complex, subtle and difficult in nature. Let us try to analyze it.

Though heredity played a part in summer diarrhea, boys being much more susceptible than girls

and sex being determined by genetic laws, no person familiar with the facts would maintain that the hereditary factor was of high importance in the incidence of this epidemic infection. Nevertheless there were and are those, without biological or medical training, who maintain that infant mortality is an illustration of natural selection, that it weeds out the unfit, and that to attempt to arrest it is to arrive at racial degeneracy. This view may be strange to our colleagues from across the Atlantic, but it is quite familiar here and has been asserted in various publications from the Galton Laboratory and the Eugenics Education Society. The general question of heredity and environment, now under discussion, has suggested to me that it might be well to attempt, once again, in the light of certain recent researches, to examine the position of those whom, with convenient ambiguity, I call the "better dead" school of eugenicists.

First, let us ask precisely what are the causes of death among infants, and then let us refer to the findings of modern genetics and see to what extent,

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if any, true heredity is concerned therein. For this purpose we must leave aside those biometric memoirs in which all manner of factors, genetic, toxic and infective, antenatal and postnatal, are hopelessly confounded, and refer to the long series of researches, conducted in the light especially of Mendelism, by the Eugenics Record Office, Cold Spring Harbor, Long Island, N. Y. The solitary instance, we find, of a factor of infant death which is truly genetic, due to the intrinsic transmission of something in the germ cells, is hemophilia. This is, of course, a rare malady, of no statistical importance at all in the problem of infant mortality. One cannot but be amused to observe that even this solitary instance signally fails to support the contention that infant mortality is eugenic and beneficently illustrates natural selection, for the disease is transmitted by the female, who does not herself suffer from it and who, therefore, such being the laws of heredity, defies the blessed principle of natural selection by declining to die of the disease in infancy or thereafter, and by living to transmit it to her own sons. The better dead theory thus breaks down even in the one instance which might be expected to illustrate it; and here that theory, which has its origin not in the findings of science, but in political prejudice and class selfishness, may be dismissed with a gesture of the high contempt which is the due of those low motives.

It is now the task of science to define, as exactly as we can, the various antenatal factors of life and death; our task being both easier and more difficult since the natural history of the germ cells has so little to say and leaves us to discover so much elsewhere.

ANTENATAL FACTORS OF LIFE AND DEATH.

1. *Genetic*.—As in hemophilia, which ironically enough, while killing a small number of male infants, expressly spares the females who transmit it.

2. *Toxigenetic*.—There may be identified, however, certain factors which affect the germ cells for the worse, but yet are certainly not genetic in any proper sense. They come in from without, as toxic agents, injuring the germ cells and spoiling the normal inheritance of genetic factors. These agents I now propose to call toxigenetic.

The action of poisons upon the germ cells, or upon gametogenesis, to be more exact, has been called blastophthoria by Forel. Since these poisons, fortunately few, strike not merely at the individual, like most poisons, but at the race, they are the most typical examples of those agents to which in 1906 I gave the general name of racial poisons. Lead and alcohol are the most noteworthy of them; but I shall not here attempt to recapitulate the evidence, much of which may be found in the chapter on racial poisons, for which I am partly responsible, of *Alcohol and the Human Body*, by Sir Victor Horsley and Dr. Mary Sturge (1), and in my book on *The Eugenic Prospect* (2). It will, of course, be obvious that, in order to demonstrate that these agents act by blastophthoria, we must obtain evidence from their action on the father alone. This has been done by breeding experiments and microscopic study for alcohol, and by breeding experiments alone for lead in the lower animals; and by

the postmortem microscopic observations of Bertholet in Lausanne and Weichselbaum in Vienna, for alcohol, in man. Other metallic and metalloid poisons, such as mercury and arsenic, may have similar action, and the student may be referred to Ballantyne's classical volumes on *Antenatal Pathology*; but for practical purposes against infant mortality, lead and alcohol alone matter, and we are accordingly required to concern ourselves with such questions as the employment of possible parents in the white lead industry and the drinking of alcohol by adolescents—a habit steadily growing in Great Britain and now practically banished from the United States and English speaking Canada. Here, of course, I am now merely concerned to state the categories, not to deal with any of them in detail.

3. *Gestational*.—Here, as might be expected, we meet lead and alcohol again, these poisons passing readily through what Ballantyne has taught us to call the placental filter, and being easily found in the fetal tissues or the amniotic fluid. Many other poisons come under this heading, including poisons made within the maternal body and killing the child before or after birth. These may be classified as follows:

a. *Toxic*.—These include the exogenous and endogenous poisons. The importance of both is immense. We are accordingly required to protect the expectant mother from, for instance, white lead poisoning, that being the legitimate object attained by those regulations of the Home Office which we really owe to the observations and recommendations on this subject of Sir Thomas Oliver, of Newcastle; and, for example, to advise against the use of stout and porter by the expectant mother. We must further encourage obstetrical research and ask for the systematic care of the expectant mother, in such ways as the routine examination of the urine for the menace of eclampsia, along the lines advocated for many years notably by Dr. Amand Routh. More and more we perceive that, as I have maintained for many years, infant mortality is less—and, indeed, yearly ever less—a medical problem of infancy than a social or medicosocial problem of motherhood (3). But, indeed, the toxic are only the first of several types of gestational factors of infant mortality.

b. *Infective*.—The most important of these factors is the *Spirochæta pallida*. Here, also, we must include the infective agent of rheumatic fever which, by entering the fetus and causing, for instance, endocarditis of the tricuspid valve, may lead to early death after birth.

c. *Nutritive*.—Recent research in dietetics has suggested to me that we must also consider the possibility of nutritive or malnutritive factors to indicate the possibility that defective feeding of the mother may be fatal to her offspring, whether before or after birth. There is, first, the possibility, as recent observations in Vienna appear to indicate, that acute conditions of the rachitic or osteomalacic type may occur in the pregnant woman who is deprived of vitamine A in her diet; such conditions prejudicing parturition and thus indirectly involving risk to the child. But, more interesting still, is the possibility that deficiency of vitamines A or B in the maternal diet, meaning a deficient supply of

either or both to the embryo or fetus (neither the mother nor her offspring being able to make any vitamins for themselves) may involve defective development and vitality of the child, having various possible results. The apparent cases of antenatal rickets quoted by Ballantyne and others may have this causation; and elsewhere (4) I have suggested that part, at least, of the very large proportion of stillbirths which remain unexplained even when the most complete modern research has been made for syphilis, may be really due to fetal A-vitaminosis, dependent upon defective feeding of the mother.

In the communication above referred to I suggested, in view especially of what I had seen in C. R. Stockard's laboratory at the Cornell Medical School in New York, that the alcoholic factor of stillbirths has not yet been adequately inquired into; but it seems probable to me that, even when both syphilis and alcohol have been fully incriminated, we may find a large number of stillbirths without evident cause, and that cause may become evident if we inquire further, not least by animal experimentation, into the consequences of a maternal diet defective in vitamins (not only A but also B and possibly even C) upon the unborn child. Much experiment, on the lines which I then indicated, is now being conducted in this country under the auspices of the Medical Research Council. It need hardly be said that these researches may throw light on the causation not only of stillbirths, but of much mortality after birth and especially upon that neonatal mortality which, in marked contrast to our success against summer diarrhea, still so largely defies us, both in this country and the United States. The

very important relation of diet and vitamin deficiency to lactation and the possible occurrence of rickets among breastfed children, as among those of the wrongly fed negroes of New York, is outside the scope of this paper, but is obviously a continuation of this theme.

4. *Obstetrical factors.*—These may be called natal or intranatal, to distinguish them more particularly, but which are all operative before birth is accomplished, and are all really antenatal in origin. Their importance, especially in relation to neonatal mortality (which is almost wholly due to antenatal causes in general) is immense.

The foregoing analysis demonstrates that, while true heredity is negligible in infant mortality, and the better dead theory is accordingly baseless, the antenatal factors (including those operating through the paternal germ cells) are now of the greatest importance, summer diarrhea being suppressed; and that, for great onward strides, we must concentrate upon the protection of youth and adolescence, from the racial poisons, especially alcohol and syphilis, and upon the perfect nutrition and the complete and continuous protection from intoxication and infection of the expectant mother. That, beyond all else, is now and ever was and ever will be the way to save the baby and the human race.

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The Dangers and Treatment of Antenatal Syphilitic Environment*

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The influence of syphilis on the human embryo has been the subject of much investigation, but it is at present impossible to give an accurate statistical estimate of its gravity. We have to remember, 1, that the mother may be suffering from syphilis in an active or in a latent stage when impregnation takes place, and may already have had one or more miscarriages or stillbirths, and 2, that the mother may be infected with syphilis at any time during pregnancy. The environment of the embryo may, therefore, be infected from the beginning or at any time during the pregnancy.

We can, for practical purposes, leave out of account the possibility of an embryo being syphilized by the father alone. At one time this was considered important, but our later experience points to the mother being the chief source of congenital syphilis. Probably the most extensive series of observations on the incidence of congenital syphilis is

that of Dr. Williams, of Baltimore, who gives statistics of ten thousand pregnancies. Of these there were 705 stillbirths and twenty-six per cent. of them were due to syphilis. In addition to these he found that 3.5 per cent. of the children born alive were syphilitic. This makes a total of five per cent. syphilis in 10,000 pregnancies (1).

The influence of syphilis in the causation of premature births, stillbirths, and infant mortality is shown in the statistics of syphilitic families reported to the Royal Commission on Venereal Diseases by Sir Frederick Mott, Dr. Kerr Lowe, Mr. McLeod Yearsley, Mr. Bishop Harman, and myself. Of 1,722 pregnancies no fewer than 747 ended either prematurely or the infants died a short time after birth—twenty-three per cent. Of Mr. Bishop Harman's series 390 children that survived were diseased. Of Mr. McLeod Yearsley's and Dr. Kerr Lowe's 263 survivors, eighty-five or thirty-nine per cent. were deaf or deaf and blind.

These figures are sufficient evidence of the im-

*Read at the Infant Welfare Conference held in London, July 7, 1921.

portance of dealing with antenatal syphilis by every means in our power, but we have further evidence of the extent of the disease in the surviving children. Dr. H. F. Watson found that the incidence of congenital syphilis at the Glasgow Sick Children's Hospital was ten per cent. (2). From other sources we learn that the incidence in large cities varies roughly from two to six per cent. But the most terrible statistics come from the Prague Foundling Hospital where Epstein obtained a positive Wassermann in thirty-three per cent. of 296 newly born infants.

Now, I maintain that this mortality *in utero* and early life and the grave later effects of congenital syphilis, can be rendered insignificant if not entirely removed. As a matter of fact it has been largely reduced already. The scientific basis of this contention is as follows: The *Spirochæta pallida* circulating in the blood of the mother swarms in the wall of the uterus in which the embryo is embedded in the earliest stage, and in the placental tissue whence the fetus derives its nutrition during the major portion of pregnancy. The embryo may be infected near the beginning of its development and then easily perishes, or it may be infected late and then has a better chance of survival. In some rare instances infection only takes place in the act of birth. Dr. Eardley Holland had one such case where a primary sore developed in an abrasion made by the forceps during delivery, and Dr. Lomholt, of Copenhagen, has recently published reports of three similar cases.

The next fact is that the treatment of the mother by salvarsan and its allies while the fetus is still *in utero* is remarkably efficient. In December, 1918, I showed at the London Hospital forty-five healthy babies born of syphilitic mothers who had been treated in my clinic during their pregnancy. There is a spirit of friendly rivalry in the statistics which have been published recording the results of the treatment of pregnant syphilitic women. Statistics vary from ninety to one hundred per cent.

The scientific bases being those determined by repeated tests, we have now to direct our attention to the machinery by which they can be made of service to the State.

1. It is important above all things to impress upon the public that no person who has contracted syphilis

should marry while likely to infect the other partner to the marriage. We must, therefore, insist on the obligation to remain under treatment until medical sanction is given to the proposed union. At present we have no compulsion, no certificate of freedom from disease. Perhaps this may come.

2. If a woman comes to a venereal disease clinic suffering from syphilis and is found to be pregnant energetic treatment must begin at once no matter what the stage of the pregnancy.

3. Any woman who has had repeated miscarriages should have her blood examined by the Wassermann test. If this is positive she should at once begin treatment. We must therefore have close cooperation between the general practitioners, the hospitals, maternity centres, and a laboratory where the examination can be made. These facilities are provided by the State. The examinations are made free of charge. All that is wanted is that they should be used. Notification of miscarriages and stillbirths would be of service, but it is doubtful if it would be practicable.

4. Should a married man or woman attend a venereal clinic the other partner should be examined and if found infected treated. Any children of the pair should also be seen and examined. One may thus find early evidence of congenital disease.

5. If a child is brought to a clinic suffering from congenital syphilis the parents should be seen, and if necessary treated. I make a point also of seeing, whenever possible, all the other children. One cannot always get both parents to come up, but by persuasion and tact it can usually be effected. But we have no compulsory powers.

The machinery for effecting this most desirable and beneficent work is at hand. We have the maternity clinic, the infant welfare centre, school inspection, whence the cases can be drawn; the laboratory where the necessary blood examinations can be made and the venereal clinic where the treatment can be carried out. Let us use them, and we may hope for the gradual disappearance of a grave menace to life and health.

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Congenital Abdominal Ascites with Other Abnormalities

Report of a Case

By LOUIS BLUMENFELD, M. D.,
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CASE.—The patient's chief complaint was labor pains. Her family history was negative. She had had measles and pertussis; her appetite was good; bowels were constipated; she drank tea and coffee daily. Venereal history was denied, the patient never had had any vaginal discharge. Menstruation began at thirteen years of age and was irregular in type, varying from twenty-one to thirty days. The period

lasted from four to seven days. The patient had had marked premenstrual pains before marriage but had had none since she was married, i. e., since she had had her first baby. The last menstrual period was April 3, 1920, and during the month of July she stained daily for two weeks.

The patient had had six previous pregnancies. The first occurred shortly after marriage and the

patient delivered a premature dead fetus at eight months. The fetus presented no anomalies and the cause of death was unknown. After this the patient was ill for two months with bleeding, and was under a physician's care for four months. The second pregnancy occurred four months after the delivery of the dead fetus and the patient was delivered of a full term female infant weighing eight pounds.

Following this labor the patient had a postpartum hemorrhage. Six months later the patient again became pregnant but had a spontaneous miscarriage at six weeks. She was curetted. About eleven months later the patient again became pregnant and was delivered of a healthy full term male infant.

She again became pregnant and not wanting another child she had an abortion done at the second month. The patient afterward bled intermittently for seven months when she had a severe hemorrhage and was packed by a physician. Fourteen months later she was again delivered of a full term male infant. On February 10, 1920, a curettage was done because the patient had missed her period for seven weeks. On April 3, 1920, the patient menstruated last and up to July no blood was seen. During these three months she suffered from headaches, nausea and vomiting. During July she stained for two weeks. Patient felt ill with headaches, lassitude and pain in the lumbosacral region until October 23, 1920, when she went into labor.

On October 23rd, about 9 p. m., I was called to see this patient in labor. The last normal period occurred about seven months ago. She was passing blood clots and having regular labor pains about every ten minutes. Upon abdominal examination I could feel no small parts. The size of the abdomen was that of a full term pregnancy. The cervix showed about one finger dilatation. The head was in a right occipitoposterior position. The head could be easily displaced above the brim of the pelvis. I advised that in consideration of her condition the patient be sent to the hospital.

The patient was brought to the Swedish Hospital. I again examined her and confirmed my previous diagnosis as to the position of the head. The fetal heart was about 130 to the minute. The pains were coming about every eight minutes. The cervix was still about one finger dilated. At 2 a. m. an abdominal examination was made by the house surgeon. The fetal heart was distinctly heard and about 140 beats to the minute. I saw the patient at 8.30 a. m. I could not hear the fetal heart. The cervix was about three fingers dilated. The head was in the pelvis but could be easily displaced above the brim. The membranes had ruptured about 7 a. m. The patient was having pains at three minute intervals. About 9.30 a. m. the cervix was completely dilated and the head was well down in the pelvis but not firmly fixed. I displaced the head above the brim and easily rotated the head to a right occipitoanterior position but the head would not stay in the anterior position and returned to the right occipitoposterior position. I decided to let the head be born in the posterior position since the head was small on account of its prematurity. During

the next half hour the woman had rather severe pains, the head showing at the vulva with each pain but returning into the pelvis during the interval.

The patient being exhausted I applied forceps and very easily lifted the head over the perineum. There were no signs of life. The body did not follow the head as it usually does. I delivered the upper extremities and still the body could not be extracted. I inserted my hand into the uterus and found the body was symmetrically enlarged and cystic and occupied the entire uterus. The patient was anesthetized and the fetus decapitated. A scissors was then passed into the uterus under the protection and guide of the hand and the fetal abdomen punctured. The upper extremities of the fetus were used as tractors. As the fluid escaped the abdomen collapsed and the body of the fetus was completely delivered at 10.30 a. m.

DELIVERY OF THE PLACENTA.

After waiting in vain about a half hour for the placenta to be expelled, I passed my hand into the uterus and found the placenta firmly adherent to the uterine wall. I removed the placenta manually. There was little bleeding. The uterus contracted and remained firm. The patient's recovery was uneventful.

PATHOLOGICAL REPORT.

The fetus was examined by the pathologist of the hospital. His report follows.

The abdominal wall was very much enlarged and thinned. The upper and lower extremities were as those of a five months fetus. The head was the size of a seven months fetus. There was a complete absence of both external and internal genitals, anus, rectum and sigmoid. The urinary bladder was very much thickened and distended with fluid. Both ureters were distended and emptied into the bladder. The descending colon emptied into the bladder. The bladder was probably the cloaca with both ureters and colon emptying into it. The urachus was very much distended and filled with fluid. The umbilical end of the urachus was floating free in the abdominal cavity. All other organs of the abdominal cavity were about the size of those of a five months fetus. The thorax and its organs were about the size of a five months fetus. The left and right ventricles were separated for about half their length and showed two distinct apices. The fetus was sent to the Long Island College Hospital for further study.

CONCLUSIONS.

Williams in his textbook on obstetrics gives the following causes of dystocia due to enlargement of the body of the fetus: General dropsy; ascites as a result of fetal peritonitis; congenital cystic elephantiasis; distention of bladder as a result of retention of urine; congenital cystic kidneys; tumors of the liver; fibrocystic testicle; fetal aortic aneurysm; fetal inclusions; abdominal growths: lipomata, carcinomata, etc.; dermoid cyst about the perineum and sacrum; umbilical hernia; spina bifida; invasion by the *Bacillus aerogenus capsulatus* causing the production of gas.

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Editorial Articles

EXPERIMENTAL WORK IN CANCER.

It is occasionally very difficult, not to say impossible, to distinguish in a section of sarcomatous tissue whether the specimen is a malignant growth or a tuberculous, syphilitic, or actinomycotic proliferation. The histological arrangements of the neoformed connective tissue elements may be similar to such a degree that in the present state of our means of investigation the differential microscopic diagnosis does not appear to be possible. If in order to settle the question in our minds we consider for the moment only tuberculous sarcoma, in order to compare its characters with those of malignant neoplasms, it will be noted that independently of their morphology there exist important differences between the two types of neoplasms.

Malignant sarcoma is infinitely proliferous and its longevity exceeds that of the individual it attacks. Unless an early and an extensive excision is done, it recurs after late operations and progressively invades the adjacent tissues and organs. Besides, it gives rise to distant metastases which also invade the structures adjacent to them and invariably end in death to the patient. Tuberculous sarcoma, however, is incapable of giving rise to metastases, and its excision usually results in recovery. The physiological properties of the tumor extractives are likewise different in the two types of neoplasm. The extract of sarcoma is very toxic, causes cachexia, and is endowed with intense negative chemotaxic properties, often killing the animals into which it is injected, while the extractive products of tuberculous sarcoma, obtained in the same way, do little harm to the healthy subjects, but in tuberculous patients provoke specific reactions characteristic of the toxins of Koch's bacillus. The inoculation of a bit of malignant tumor may, in certain animals, give positive results, reproducing the neoplasm, while tuberculous sarcoma, when transplanted into the same species of animal, has never been known to give rise to an analogous growth, but it quickly infects certain other animals, provoking in them the usual lymphatic and visceral lesions of experimental tuberculosis.

Finally, small grafts of sarcoma treated by sublimate at one one thousandth, or forty per cent. alcohol, do not lose their faculty of being successfully transplanted, while the action of these antiseptic solutions may destroy the vitality of the tuberculosis bacillus and result in negative inoculations. Briefly, the characters of all tuberculous

tissues are to be found in the sarcomatous form of the infection and these characters are due, not to the properties of the proliferated connective tissue cells, but to the bacteria they harbor. Therefore, by analogy, may it not be supposed that the singular properties of malignant sarcomata are also the result of some peculiar parasite whose perpetuity, the nature of their toxins and their resistance to physical and chemical agents explain the facts observed.

From this comparison between benign inflammatory sarcomata and malignant connective tissue neoplasms, a new argument seems to spring up in favor of the parasitic theory of cancer. Tuberculous bacilli inoculated in animals never give rise to sarcoma, but how does it happen that they can occasionally provoke proliferation of the connective tissue elements resulting in the production of a sarcomatous tumor when this proliferating process can never be experimentally reproduced with the microbic agent, which nevertheless sets it up in unknown conditions? If, by inoculation, this connective tissue proliferation could be obtained at will by the tuberculosis bacillus, perhaps one reason for cell proliferation might be discovered, in other words, one of the causes of cancer. It is possible, even probable, that a certain condition of the soil is necessary for proliferation to take place and this hypothesis was kept in mind by A. Lumière in his recent remarkable experiments. And although these are not as yet very far advanced and so far have not given the hoped for results, the suggestions mentioned above as to the theory of the cause of cancer should not be lost upon biologists, in consideration of the urgency of the cancer problem at the present time.

EMPIRICAL MEANS FOR DETERMINING THE SEX OF THE FETUS IN UTERO

It would seem an established fact that fecundation is possible before, during, and after the menses, during a total lapse of time, or at least fifteen to twenty days, supposing even that a period of agnosia exists in women. The determination of the sex is not a matter of chance; it must obey precise laws. Syngamy is a theory that has not, up to the present time, been based upon any precise fact, at least in man. It would also seem that metagamy can also be eliminated, and much noisy discussion has, above all, shown that maternal overfeeding exercises no influence on the sex of offspring. Progamy alone appears to be founded on precise facts.

The influence of the most vigorous generator—verified in certain animals—is difficult to control in man, the appreciation of the physiological state of the reproducers being a very delicate matter. The presence in hens and canaries of ovi destined to engender either the male or the female sex would seem to be an accomplished fact, but for the present, at least, we are not in a position to apply these data to all animate beings. The law of Thury-Boissard, recognized as exact in the bovine and ovine species, appears to have been verified in man, at least so far as its first proposition is concerned. The few exceptions noted can hardly in themselves contradict the exactitude of a law based on numerous observed facts in zootherapy and clinical obstetrics.

When the first papers of Robinson and Regnard drew attention to the possible relationship existing between the suprarenal and other endocrinous glands to the sex of the offspring, Vignes, comparing this hypothesis with the relationship, badly understood for that matter, which exists between these glands and cutaneous pigmentation, hit upon the idea of verifying if there might be some truth in the belief that the abdominal dark line could serve in the prognosis of the sex of the offspring. Some observers admit that a very dark line is present when the fetus is a female, and researches on the subject were carried out several years ago. By this means G. Martin was able to arrive at more exact than inexact results, but he believes with Boissard and Vignes that he happened to come upon a lucky series of results.

It is also to be recalled that certain diseases may influence the state of the dark abdominal line, and such causes of mistake must be taken into consideration. Thus, tuberculosis causes hyperpigmentation of the abdomen in the pregnant woman, while in women with a Venetian complexion this line is relatively intense, even in the fifth month of pregnancy. But it is probable that Holl's researches in this direction will be unconvincing to most of the profession, while in opposition to this observer's conclusions the popular belief that a very dark line indicates that the fetus is a male may be considered.

Other observers have regarded the frequency of the fetal heartbeats as having a bearing on the prognosis of the sex. It has been maintained that a count above 140 to 150 beats indicates that the birth of a female child may be predicted, a lower count indicating that the fetus is of the male sex. We now know, however, that this assertion is exaggerated and many prognoses so made have turned out to be erroneous.

The occurrence of epileptic seizures during pregnancy was regarded as an indication of the sex of

the fetus by practitioners of the seventeenth and eighteenth centuries. They maintained that offspring of the male sex produced the paroxysms. This is not devoid of interest since Claude and Schmiergeld have studied the alteration of the vascular glands in epilepsy and may be reconciled with the part attributed to them by Robinson.

In conclusion, the belief current in Japan should be mentioned, that the sex of the fetus may be predicted by examining the implantation of the hair on the neck of the child previously born. If the hair has a convergent implantation in this child, a female child will be born after him, while a male child will be born if the hair has a divergent direction. Strange to relate, E. S. Mowe (*Journal of Anatomy and Physiology*, third series, Vol. IV, Part IV, page 420) has controlled the exactitude of this belief in three hundred cases and found eighty-five per cent. conclusive results.

INDUSTRIAL SICKNESS.

Industrial medicine and surgery are receiving more attention now than ever before, because it is universally recognized that industrial sickness and accidents can no longer be allowed to take the heavy toll of life and health they have done in former years. The health of workers is an economic question, and farseeing employers, therefore, are using every possible means to maintain at a high level the health of those who work for them. However expensive the measures to insure this may be in the first instance, in the long run the proper care of workers repays a hundredfold. With this end in view, factories and workshops are rendered sanitary and hygienic in every detail; hours of work are shortened, resting periods are more frequent than was the case formerly, and every effort made to relieve the monotony of toil. The constant repetition of the same processes is the most trying of all kinds of work, and unless something is done to render it less dull, interest is destroyed and, in consequence, really good work is impossible.

All trades, however, present certain unhealthy features. Some are obviously dangerous, others dangerous in a less degree. According to Sir Kenneth Goadby, who for nine years has acted as specialist referee for the British Home Office in cases of industrial sickness, a great deal of the disease acquired even in dangerous trades is preventible. Lecturing recently before the Royal Society of Arts, in London, he said that twenty years' experience had demonstrated that not merely were certain persons more susceptible to or more immune from occupational diseases than others, but what was more important, the exciting causes were determinable and

could be eliminated, checked, or neutralized. He pointed out that immunity might be acquired by susceptible persons and susceptibility by resistant persons. Diseases arising from dust, fumes, and vapors comprise a large proportion of industrial sickness, and Goadby's investigations suggest that the population contains a considerable number of persons who show individual susceptibility to lead poisoning. Among painters, much of the sickness attributed to lead poisoning, in the absence of routine medical examinations, was really due to some other cause. In Great Britain, in the manufacture of white lead the number of fatal cases of lead poisoning dropped to zero in 1916, whereas in the painters' industry and in coach and shipbuilding, they formed a large proportion of the deaths from all injuries.

Sir Kenneth Goadby thought that the high incidence of lead poisoning in the painting trade was difficult to understand, as the risk of lead dust inhalation would appear greater in the manufacture than in the use of lead as paint. His own investigations into the action of turpentine on the animal body had shown clearly that the usual painter's colic, so often contracted by breathing the air of newly painted rooms, was turpentine poisoning. Another disease common among painters was hardening of the arterial tissues, resulting in increased blood pressure, and experience pointed to this being the consequence of inhaling turpentine vapor.

The point of the lecture, however, was that Sir Kenneth Goadby had discovered means whereby much of the poisoning could be prevented. He advocated certain blood tests, by the use of which susceptible persons could be eliminated from an occupation inimical to their well being. It is said that these tests are simple and easy to carry out, while the estimation of blood pressure is an ordinary routine of medical practice. It is obvious that a selection of workers for specially dangerous processes would not only reduce the incidence of industrial poisoning in many occupations, but might even render safe some trades now regarded as dangerous. As Sir Kenneth Goadby said: "The prevention of disease by prohibiting the use of some special form of poisonous or partially poisonous compound may do more harm by creating unemployment than good by protecting from risk the few susceptible persons."

It seems that these suggestions contain the germ of great potentialities. By selecting immune persons for dangerous trades these trades would be no longer dangerous, and much human suffering and waste would be prevented. If blood tests can be depended upon to indicate with accuracy the individuals who are immune from particular poisons, a long step in advance will have been taken in industrial preventive medicine.

THE EARLY DIAGNOSIS OF ACUTE POLIOMYELITIS.

Poliomyelitis is still an obscure disease and one which is not easy to recognize in its early stage, when, even if not cured, it may be so treated that its crippling effects will be somewhat modified. The difficulty in correct diagnosis seems to be that it is frequently not differentiated from other diseases of infancy and childhood which present certain points of resemblance to poliomyelitis. As Dr. E. Farguhar Buzzard pointed out in a paper read at the recent annual meeting of the British Medical Association, mistakes in the early diagnosis of acute poliomyelitis have their chief origin in an imperfect conception of the disease. Up to fifteen years or so ago, it was usually regarded as a mysterious affection of the nervous system belonging in the province of the neurologist. It was not included, as it should have been, among the acute specific fevers. As a consequence the possibility of acute poliomyelitis rarely entered the mind of a physician when he was confronted with a child suffering from fever, headache, vomiting, and convulsions. He was prepared for and even welcomed the development of a rash which provided the clue to a diagnosis, but he was quite unprepared for the appearance of paralysis, and its onset came as a shock.

Buzzard is of the opinion that the diagnosis of acute poliomyelitis is therefore not likely to be made early, until its place among the acute specific fevers has been firmly established in the mind of the profession. Acute rheumatism has been confounded with poliomyelitis, owing to the fact that twenty years ago it was taught that poliomyelitis was a painless disease. Scurvy in an infant may be mistaken for poliomyelitis, as may also an epiphysitis of syphilitic origin. Moreover, the condition is likely to be confounded with other acute infective diseases of the nervous system, such as meningitis, toxic polyneuritis, Landry's paralysis, disseminated or ascending myelitis, and lethargic encephalitis.

With regard to its differentiation from the last named disease, there are certain features which are peculiar to each disease. Practically all cases of lethargic encephalitis present cerebral symptoms and signs, but a small minority are characterized by evidence of spinal cord involvement as well. Again, from the etiological point of view, poliomyelitis is a disease affecting infants and children principally, the incidence rapidly declining as age advances. It prevails chiefly during the summer months, is acute in its onset, and runs its course in a few days. Lethargic encephalitis, on the other hand, attacks persons of all ages impartially. It is more prevalent during the winter and varies enormously in its mode

of onset and in the duration of its attack. Although the presence or absence of any particular symptom or sign is insufficient to differentiate between the two diseases, since inflammation of any part of the central nervous system is a factor common to both, there are certain features in many cases of lethargic encephalitis which are to some extent characteristic. These are lethargy, the midbrain symptoms, and the involuntary movements and muscular contractions which have drawn so much attention to the disease. But, and this is the unfortunate feature of poliomyelitis, at present no diagnosis can be made at the stage when appropriate treatment would be likely to exert an influence on the course of the inflammatory process in the spinal cord. Serum diagnosis is possible, but Buzzard draws attention to the fact that the length of time involved in its elaboration renders it of little practical value, while there seems to be doubt as to its reliability in very early cases.

Early diagnosis of acute poliomyelitis, therefore, still remains largely in the province of the clinician, and it may be said that treatment rests principally in the hands of orthopedic surgeons, that is, it is of a mechanical nature. Indeed, at the present time, the treatment of poliomyelitis is physiotherapeutic and orthopedic rather than medicinal. In the course of time a means of early diagnosis and perhaps of preventive treatment may be evolved. This, however, will come about by revising all old time views as to the nature of the disease. Buzzard is probably correct when he says that early diagnosis will only come to pass when poliomyelitis has been definitely put in the category of acute specific fevers.

PHYSICIAN AUTHORS: MARK AKENSIDE.

It is infrequent that struggling young physicians have such real friends in need to help them out of embarrassing situations and put them in financial comfort and ease as had Dr. Mark Akenside in his friend Jeremiah Dyson. After Akenside had got his medical degree (May 16, 1744) at the University of Leyden, he returned to England and began practising at Northampton. There he found an older physician so strongly entrenched that he was unable to build up a paying practice. Besides, as Edmund Gosse tells us, he had a naïve tendency to arrogance which was a great disadvantage to him in his profession. In the winter of 1745 he was forced to return to London, almost penniless. Dyson gave him considerable aid, and he spent the next two years at Northend, Hampstead, but with almost as little success as at Northampton. It was at this point that Dyson came to his aid in a great and substantial way. He not only fitted Akenside out with a fine house in Bloomsbury Square, London, but also

allowed him £300 a year and a carriage, and went to great trouble to make it possible for Akenside to enjoy a large and fashionable practice. He got Akenside into clubs, introduced him to influential groups, and even made a canvass of his friends to get patients for Akenside. Dyson was a wealthy lawyer and influential parliamentary official. He and Akenside had become friends during their student days at Edinburgh, but just as Akenside had done to deserve such unexampled generosity on the part of his friend is not made clear in the biographies. It seems to have been just a big hearted man's way of showing a true friendship for a less successful friend.

Up to this point in his life Akenside had been dividing his time between literature and medicine, and had made a wide reputation for himself as a poet, but thereafter he devoted himself unremittingly to advancing himself in his profession, and only occasionally amused himself in his leisure hours by composing poetry. He also wrote a number of medical essays. He never, however, rose to great eminence as a physician. His love of political controversy, the high opinion he held of himself, and his snobbishness militated too much against his popularity. But his record is a commendable one, nevertheless. In January, 1753, he was admitted by mandamus to a doctor's degree at Cambridge and in the same year was elected a fellow of the Royal Society. In April, 1754, he was admitted to fellowship in the College of Physicians, and in September, 1755, was elected fourth censor of the College of Physicians and delivered the Gustomian lectures. He was appointed assistant physician at Christ's Hospital in January, 1759, and two months later became chief physician. In that capacity he aroused considerable protest because of his brutal roughness toward patients, and it is said that on several occasions the hospital board was on the point of dismissing him. Another sidelight on Akenside's character developed when, in 1761, he was appointed one of the physicians to the queen. He had been a Whig all his life, but promptly became a Tory, much to the disgust of many of his friends. Smollett had a bitter grudge against him and mercilessly burlesqued him in *Peregrine Pickle*, probably because he had slurred Scotland.

Akenside was born on November 9, 1721, at Newcastle-on-Tyne. His father was a butcher, and when the boy was seven years old a cleaver fell on his foot as he was playing in his father's shop. As a result of this accident he was permanently crippled. He was educated, first at the Newcastle free school, and then at a private academy kept by a dissenting minister. When he was sixteen he sent a poem,

The Virtuoso (in imitation of Spencer) to the *Gentleman's Magazine*, then the leading literary periodical of the day. The poem was accepted and Akenside became a regular contributor to the magazine. Newcastle dissenters were so proud of his poetry that they clubbed together and sent him to Edinburgh University, in 1739, to study for the ministry, but after one winter's study of theology he quit it to become a medical student. It was said that thereafter he lost all interest in religious inquiry, and in the study of medicine showed the same brilliant quickness and capacity that he had in literature. He was elected a member of the Edinburgh Medical Society on December 30, 1740, at the age of nineteen, and became such a favorite as a speaker at meetings of the society that he began to aspire to a parliamentary career, an ambition that he never realized. "His mind," says Gosse, "was rapid and precocious rather than original, and neither in rhetoric nor medicine did he fulfill the promise of his boyhood."

During the time of his studies at Edinburgh he continued to gain fame as a poet, and in 1741 left the university to return to Newcastle, where it is said he did some practising as a surgeon, but devoted most of his time to completing what afterward turned out to be his greatest work, a didactic poem of two thousand lines of blank verse, in three books, called *The Pleasures of Imagination*. This poem was inspired by a series of essays on imagination by Addison. Akenside had it completed by 1743 and took it to London to find a publisher. Dodsley brought it out, on Pope's advice, in 1744, and it was received with great applause. A second edition, in cheaper form, was brought out four months later, and there have been several editions since that time. There have been all sorts of conflicting opinions of this poem, just as there have been all varieties of views on many another literary product that has turned out to be more or less of a disappointment in its ability to withstand the onslaughts of time. Hazlitt, Lowell, Saintsbury, Dowden, Carlyle, Samuel Johnson—these and many others have praised his poetry, but always with reservations.

Akenside seems to have been more bent on a career in medicine than a career in literature, for even when he was being lionized in London after his arrival there with *The Pleasures of Imagination*, he cut his visit short and went to Leyden to renew his medical studies. After a short tour of Holland he concentrated on his studies at the university, and in little more than a month got his degree. He returned to England immediately and began his ill-fated period of practice at Northampton. The

scarcity of patients at Northampton and Northend accounted for his last poem of any great merit, *The Hymn to the Naiads*, perhaps the most elegant of his writings. He also had time while at Northend to edit Dodsley's magazine, *The Museum*, to which he contributed many essays in prose. In London it is probable he would have failed, too, had it not been for Dyson. He died June 23, 1770, at the age of forty-eight years and six months, and left all his literary effects and other property to Dyson. He had never married.

News Items.

Electrotherapeutic Society to Hold Meeting.—The New York Electrotherapeutic Society will hold its next meeting at the United States Naval Hospital, Brooklyn, on Wednesday, October 5th, at 8:30 p. m. An interesting program has been prepared, including an exhibition of equipment, methods and results of treatment, and moving pictures.

Hospitals Planned by Shriners.—At a meeting of the Hospital Committee of the Imperial Council of the Shrine, held in St. Louis, Mo., on September 25th, preparations were made for a drive to collect \$8,000,000 for the erection of hospitals. The central hospital, to cost approximately \$1,000,000, will be in St. Louis, with subsidiary institutions in San Francisco, Shreveport, La., Portland, Ore., Minneapolis or St. Paul, Minn., and Montreal.

Scientific Aid Wanted in Division of Anthropology.—The United States Civil Service Commission announces an examination on October 19, 1921, for scientific aid in the Division of Physical Anthropology, National Museum, Washington, D. C.; salary \$125 a month. Applicants must have had at least one year's experience in a laboratory of physical anthropology. The duties of the appointee consist of caring for anthropological collections and giving general assistance to the curator.

Anesthetists to Meet in Kansas City.—The organization meeting of the Mid-Western Association of Anesthetists will be held in Kansas City, Mo., October 24th to 28th, in conjunction with the meeting of the Medical Veterans of the World War, Missouri Valley Medical Association, Medical Society of the Southwest, and the National Anesthesia Research Society. An interesting program has been prepared, including a series of clinics, at which various new methods of anesthesia will be demonstrated.

Low Death Rate in New York.—According to reports issued by the Department of Health of the City of New York, the death rate was lower in New York during the week ending September 17th than for any week since mortality statistics have been kept. The total deaths reported numbered 967, corresponding to an annual death rate of 8.88 in a thousand of population. The lowest death rate recorded in 1920 was 9 in a thousand; in 1919 the lowest rate was 9.04; in 1918, the lowest rate was 10.05, and 1917, the lowest rate was 10.95. For the first thirty-eight weeks of 1921 the death rate was 11.47 in a thousand of population, compared with a rate of 13.8 during the corresponding period in 1920.

Smallpox Epidemic in Chile.—According to press despatches from Santiago, Chile, dated September 25th, there are more than fifteen hundred cases of smallpox in that city, with seven hundred in the pest house. The death rate, however, has been low. The disease is said to be on the increase in towns in the interior, while in Valparaiso an average of seven new cases are reported daily.

Cancer Week.—The American Society for the Control of Cancer announces that October 30th to November 5th is to be National Cancer Week, when facts concerning cancer will be given to the public by means of lectures and the distribution of literature. The executive secretary, Frank J. Osborne, 25 West Forty-fifth Street, New York, will be glad to furnish information to all who are interested in this campaign.

State Civil Service Examinations.—Among the positions for which the New York State Civil Service Commission will hold examinations on October 22d, are assistant bacteriologist to the State Department of Health, salary \$2,250; laboratory technician, to county tuberculosis hospitals, salaries varying, and first assistant superintendent (physician) to the New York State Reformatory for Women at Bedford Hills, salary \$3,000 and maintenance.

International Congress of Eugenics.—The Second International Congress of Eugenics was held in New York September 22d to 28th. Major Leonard Darwin, president of the Eugenics Educational Society of Great Britain, and a son of Charles Darwin, delivered the opening address, in which he gave a history of the eugenics movement. Others who delivered addresses were Lucien Cuenot, of Nancy, France; Dr. Herman B. Lundborg, of the University of Upsala, Sweden, and Dr. Irving Fisher, of Yale University, and Dr. S. Adolphus Knopf, of New York.

Personal.—Dr. Carlo Savini announces the removal of his office to 43 West Eleventh Street, New York.

Dr. Homer E. Smith has resigned from the board of medical governors and as visiting ophthalmologist to the New York Diagnostic Clinics.

Dr. James M. Anders, of Philadelphia, was elected president of the American Therapeutic Society, at the recent annual meeting. Dr. Anders was also recently elected president of the American College of Surgeons.

Dr. John Oliver has resigned as professor of surgery in the University of Cincinnati College of Medicine.

Federal Government Asked to Return Polyclinic Hospital to Owners.—The trustees of the Polyclinic Hospital, New York, have petitioned the federal government to return the hospital to the trustees of the institution for civil use. The Polyclinic Hospital has been in the hands of the War Department since 1918, when it was turned over to the government as an emergency measure. The emergency has long since passed and, according to Dr. John A. Wyeth, founder of the institution, says that government officials failed to take proper care of the property and that it would cost about \$150,000 to repair the damage done to building and equipment.

Infantile Paralysis in New York.—Dr. Louis I. Harris, director of the Bureau of Preventable Diseases of the Department of Health of the City of New York, states that so far this year 269 cases of infantile paralysis have been reported to the department, with fifty-three deaths. During the week ending September 24th, sixty-nine cases of infantile paralysis were reported to the Department of Health of the City of New York, which is the largest number reported in any single week since the epidemic in 1916.

Oxford University Receives a Loan of Radium from Czechoslovakia.—Traveling as a king's messenger, Professor Soddy, of Oxford University, brought to London two grams of radium valued at £70,000, which is said to be the largest and most valuable consignment of radium that has ever been moved. The radium is from the famous Joachimstal pitchblende deposits, and England is to have the use of it for fifteen years, when it is to be returned to Czechoslovakia. It is to be used for experimental purposes by Oxford University.

Died.

AYRES.—In Cincinnati, Ohio, on Friday, September 2nd, Dr. Stephen Cooper Ayres, aged eighty-one years.

BRANNON.—In Memphis, Tenn., on Wednesday, September 14th, Dr. Lloyd Henry Brannon, of Hayti, Mo., aged thirty-six years.

CAREY.—In Glenloch, Pa., on Friday, September 2nd, Dr. Herbert B. Carey, aged seventy-nine years.

COUTANT.—In Tarrytown, N. Y., on Tuesday, September 13th, Dr. Richard B. Coutant, aged seventy-six years.

CUNNINGHAM.—In Mamaroneck, N. Y., on Tuesday, September 13th, Dr. Wilfred B. Cunningham, aged forty-four years.

DARBY.—In Columbus, Ohio, on Tuesday, August 30th, Dr. Franklin Henry Darby, aged seventy-five years.

FITTS.—In Carrollton, Ga., on Thursday, September 8th, Dr. William L. Fitts, aged fifty-eight years.

GRACE.—In Louisville, Ky., on August 26th, Dr. George H. Grace, of Greenville, Ky., aged forty-two years.

GRANER.—In New Orleans, La., on Sunday, September 4th, Dr. Edwin J. Graner, aged fifty-eight years.

HOLLAND.—In Houston, Tex., on Wednesday, August 31st, Dr. Margaret E. Holland, aged seventy-three years.

HOPKINS.—In Silver Creek, N. Y., on Thursday, September 1st, Dr. Edwin R. Hopkins.

KING.—In Lake Geneva, Wis., on Monday, September 12th, Dr. Oscar A. King, aged seventy years.

KREISLER.—In Vienna, on Friday, August 19th, Dr. S. Kreisler, aged seventy-six years.

LIPSITZ.—In St. Louis, Mo., on Friday, September 2nd, Dr. Samuel T. Lipsitz, aged thirty-six years.

LOVELADY.—In Guthrie, Okla., on Wednesday, August 31st, Dr. Benton Lovelady, aged forty-four years.

MILLER.—In Oxford, N. Y., on Wednesday, September 7th, Dr. Robert E. Miller, aged eighty-three years.

NORRIS.—In Napoleon, Ohio, on Sunday, September 11th, Dr. Ora Lee Norris, of Deshler, Ohio, aged fifty-one years.

O'BRIEN.—In Utica, N. Y., on Sunday, September 11th, Dr. Eliza O'Brien.

PERKINS.—In New Orleans, La., on Wednesday, August 31st, Dr. William Martin Perkins, aged forty-eight years.

SECKMANN.—In New Orleans, La., on Saturday, September 10th, Dr. Ivan F. Siekmann, aged fifty-nine years.

SMITH.—In Philadelphia, Pa., on Tuesday, September 20th, Dr. Charles H. Smith, aged sixty-seven years.

STROTHER.—In Lynchburg, Va., on Saturday, September 24th, Dr. William M. Strother, aged thirty-eight years.

SWANICK.—In Hoboken, N. J., on Tuesday, September 6th, Dr. James R. Swanick, of Saratoga Springs, N. Y., aged forty-five years.

LONDON LETTER.

(From our own correspondent.)

LONDON, August 15, 1921.

Ambulance Colleges Suggested—Need for Treatment and Education of Defective Children—Dissemination of Tuberculosis by Healthy Carriers—Sir Alfred Mond's Policy Outlined.

At the annual meeting of the British Medical Association, held recently in Newcastle-on-Tyne, Sir James Cantlie, F. R. C. S., gave a short address on the Claim of First Aid to Be Regarded as a Special Branch of Practical Surgery. He deplored the fact that such poor facilities were provided for the teaching of that important branch of surgery. When they went to any of the big railway stations to teach first aid they generally found that a shed was placed at their disposal. The marvel was that first aid had been done so well; but they knew it could do much better. Sir James recalled that his first class was held below the arches of Charing Cross station and he went on to tell how interest in first aid work really dated from a medical exhibition held at South Kensington in 1881. The speaker proceeded to refer to the interest taken by the German universities and hospitals in first aid, although it was England who had taught the world. Germany had given the world the military ambulance. Yet no British university had ever asked a first aid class to be held within its sacred walls. Had the universities ever attempted to raise first aid above the position it occupied today? Unfortunately no, and first aid had not yet got within the sacred precincts of our hospitals and universities. He then pointed out that when a man received a hurt or wound the dangerous time was the first twenty minutes thereafter. It was during the first twenty minutes that first aid was so important, and who had charge of the injured man in civil life during that critical period? It was the public. Therefore, it was that important period of twenty minutes which required consideration.

Sir James next unfolded a scheme for an x rays motor ambulance wagon service for Great Britain, and gave a description of the work in London and outlying districts where an x rays ambulance had been provided by the Eccentric Club. The question was a humanitarian one, and he was sure they would have no difficulty in obtaining the money to establish the service. * * *

A conference on the treatment and education of physically defective children, called together under the joint auspices of the Newcastle Invalid Children's Aid Association and the Central Committee for the Care of Cripples, was held in the Royal Victoria Infirmary, Newcastle, on July 19th last. The speakers were Mr. Rutherford Morison, F. R. C. S., professor of surgery at the College of Medicine, Newcastle, Mr. H. Platt, F. R. C. S., surgeon to Ancoats Hospital, Manchester, and Mr. R. C. Elmslie, F. R. C. S., surgeon to St. Bartholomew's Hospital, London.

Mr. Rutherford opened his address by giving some figures relating to the number of cripples in Great Britain. He said that there were three cripples for every thousand of the population, so that in Newcastle and Gateshead it was safe to say there

were fifteen hundred cripples. This was the problem they had to face and it had to be settled by hard work and organization. He would tell them that most of the conditions in children could be prevented, or, at any rate, arrested if caught in the early stages, before the crippling had become acute. It was quite safe to say that three quarters of the cripples that now existed under better conditions need not have been crippled at all. So prevention was the ideal, and it was not so far off as they might think. There must be a general health scheme throughout the country.

The three diseases which were the curse of the community just now were tuberculosis, syphilis, and cancer. Tuberculosis could be arrested and practically cured in the early stages, and this was especially true in the crippling form of the disease. With regard to syphilis, this curse was being dealt with in a sort of way, but it was only being played with. Cancer found in the early stages could be cured. That had been proved. He, therefore, agreed with the suggestion of a yearly health census, in order that disease might be caught in the early stages.

Mr. R. C. Elmslie dealt with his experiences in his work among the crippled of London. He referred to the cripple who was in the labor market without having a trade or an occupation. They had no right to run a home or an institution for the treatment of cripples without, at the same time, educating the cripples. Mr. H. Platt said that any scheme for the cripple must include surgical treatment, education and vocational training. He wondered whether the trade unions would take up the cause of the cripple, and by a small contribution from each man set up an organization to deal with the crippled. Dr. Morison, medical officer of health for Cumberland, opened the general discussion and spoke on the preventive side of the work. The crux of the question was to get the cripples away early. Thus they would do away with the necessity for half the hospital accommodation that had been asked for and they would do away with the knife, of which they all had a dread.

Presiding over the afternoon session which concerned itself about the education of physically defective children and its administrative aspect, Sir Theodore Morison said the whole question was a matter of serious national concern. His belief was that if we got an A1 population we should, at the same time, have solved some of the most urgent of our economic and moral problems. Dr. Eustace Hill, medical officer of health for the county of Durham, urged the need for more institutional accommodation, particularly in the north of England. After further discussion, Dr. Foggin, school medical officer of Newcastle, proposed a resolution calling for the formation of local invalid aid associations for the discovery of early cases of crippling, the promotion of all available means of assistance, care and education, the keeping of records of numbers, treatment required and treatment available, and that the work should be coordinated. The resolution was seconded and carried unanimously. A second resolution was submitted by Dr. A. Morison, of West Hartlepool, which stated that in the opinion of the conference, hospital school accommodation was now

most urgently needed and should be provided at the earliest possible date. This was also seconded and carried unanimously.

* * *

Among the papers read at the International Conference on Tuberculosis, held recently in London, perhaps the most important and instructive was that by Professor A. Calmette, associate director of the Pasteur Institute, Paris. The speaker, having examined data as to the incidence of tuberculosis, drew the inference that in man tuberculosis resulted from civilization. When the disease appeared in environments where no case of phthisis could be found, it seemed evident that it was able to introduce itself only through the presence of some bacillus carrier, unknown and apparently healthy, who spread virulent germs about him from time to time. He asked whether observation and experimentation were not agreed in giving numerous proofs of the unquestionable rôle played in the diffusion of tuberculosis throughout the world by individuals with occult tuberculosis, the healthy carriers of tubercle bacilli. Consequently, we must realize that the newly acquired knowledge of this hitherto unexpected danger makes the organization of social defence against tuberculosis much more difficult than when prophylaxis had to be based only on the education and isolation of phthisical patients. It remains true, of course, that the latter are by far the principal factors of dissemination of the disease but, if it was pointed out, humanity must be warned against the possibilities of infection coming from the innumerable apparently healthy individuals who are but slightly infected, with lesions limited to a few glands. Such lesions may remain indefinitely latent, yet those who harbor them may be capable of contaminating their environment. The speaker concluded by saying that the possibility of protecting the children and the general population of countries which are still comparatively free from tuberculosis can only be contemplated on the condition of reorganizing, wherever possible, a system of detection based upon a judicious use of tuberculous tests and a clinical examination of the glandular system mainly by means of radioscropy.

* * *

Sir Alfred Mond, recently appointed Minister of Health to succeed Dr. Addison, on May 12th last, in committee in the House of Commons, made his declaration of policy. He pointed out that there was a very large number of maternity centres and tuberculosis sanatoriums requiring attention. He emphasized the fact that the continued steady decline of infant mortality was particularly marked. Any one who had seen how much good a relatively small institution wisely guided could do, would certainly wish to see the work extended all over the country. He was glad to say that the number of health visitors had gone up from 1,400 to 1,700; the number of nonresident centres had risen from 1,400 to 1,900; the number of maternity homes had gone up from 740 to 1,200, and the infant hospitals for children under five years had risen from fifty to 367. Whatever economies they

had to make, he hoped that they would not economize on the infant life of the country.

Good progress was being made in dealing with tuberculosis. The work that had been done was beginning to bear fruit, the first fruit of the work done by the Ministry of Health and by the enthusiasm and zeal of his predecessor in office, who had so much special knowledge of the subject. They might achieve relatively little at the time, but they could be confident that if they proceeded on reasonable lines of care and treatment, if the people were taught hygiene and how to avoid the disease, instead of dealing with it only when contracted, they could produce a great improvement in the standard, physical and therefore moral, of this country. It was the best investment the country could make, for after all the greatest curse and unhappiness was ill health.

He was glad to say that venereal disease work was making good progress. While he did not believe in covering the country with posters to draw attention to the evil and overemphasize it, he was quite convinced that they must steadily proceed with propaganda and with treatment. He was considering now the issue of a new circular to explain the policy of the department, which consisted of a sane and moderate view of this very complex and difficult problem, which had a moral and social as well as a medical side. The moral and social side should never be overlooked; it was more important in some respects than the medical. While quite prepared to assist in having the health of the nation protected against this very terrible disease, he was not prepared to accede to the demand of those who seemed to him to regard the question, with perfect sincerity and great enthusiasm, merely from the aspect of the medical cure, without taking the wider view.

The Minister, at the close of his speech, said that he believed there was a great future before the Ministry of Health. However, he regretted very much that one of its important sections, namely, research, had been detached; he hoped it was going to be joined on again, for that was one of the most fruitful sources of development.

Sir Alfred Mond explained his policy, or that of the Ministry of Health, clearly and well. He has many difficulties to face, but his well known business abilities should enable him to overcome some and evade others. It is perfectly true that adequate and hygienic housing accommodation is badly needed in Great Britain, but it is also certain that the already overburdened taxpayer will refuse to be saddled with the main part of the immense cost of these. The large proportion of the population do not understand the great value of living under hygienic and sanitary conditions. They merely look at the cost. Education is required to make the man in the street understand that scientific means for bringing about hygienic conditions are essential to the health of a country, and that, in the long run, the cost, however great, is nothing in comparison with the attainment of this result. The ordinary citizen is sceptical of that which he does not comprehend. He is apt to regard such schemes as formulated by the Ministry of Health as devices to obtain money from him, or as the views of faddists.

Book Reviews

NONSURGICAL TREATMENT OF CANCER.

Cancer and Its Nonsurgical Treatment. By L. DUNCAN BULKLEY, A. M., M. D., Senior Physician to the New York Skin and Cancer Hospital; Member of the American Association for Cancer Research. New York: William Wood & Co., 1921. Pp. viii-457.

The views of the author relative to the nature of cancer and its therapeutics are well known. They are indicated by the statement he makes in his introduction, namely, that the mortality of tuberculosis "has declined about thirty per cent. in the last twenty years, under wise medical care, while that of cancer has risen about thirty per cent. in the same period, under surgical domination." The entire volume is based on his belief that when the principles and practice laid down by him "are fully understood, widely accepted, and generally acted upon, there will be shown a reduction in the mortality of cancer which will be conclusive and gratifying."

The author bases his reasoning and therapy on clinical data pointing to cancer as a constitutional disease, quite as much as gout, for instance. In the latter, the derangement of tissues takes on an inflammatory character, and in cancer it takes on a neoplastic form; both of them are the results of an erroneous pabulum, a faulty blood and lymph stream furnished to the cells. Why this is, we do not know; but we do know how to correct gout by dietetic, hygienic and medicinal measures, and we are learning the same about cancer, according to the author, "with gratifying results." Bulkley believes, and he produces considerable evidence to substantiate the thesis, that if there is a correct diet and mode of living, and correct action of the whole system, furnishing a correct blood stream for the proper nourishment of every cell of the body, there will be no rebellion or mutiny of cells, and consequently no cancer with its sad consequences.

Briefly summed up, the author believes cancer can be cured by the proper adjustment of diet, hygienic environment, and medication. A vegetarian diet is insisted upon; this is supported by the fact that cancer is said to be a great rarity among nonmeat-eating peoples. Hygienic adjustment requires sunlight, plenty of rest in bed, regular hours, and regular habits in every detail of life. Medication includes the proper use of such remedies as will incite the organs, including the endocrine glands, to form and eliminate properly the effete elements circulating in the system, and to effect the production of a healthy and ideal blood stream. The writer supports the late Forbes Ross in his advocacy of the potassium salts in the treatment of cancer, and confirms his statement that having used large quantities of potassium in his practice for many years, not one case of cancer had ever to his knowledge developed among his own patients. This salt would seem to be a certain prophylactic against cancer, according to these views. In cancer of the cervix the author has had remarkable results, with proper treatment, following the use of a douche containing carbolic acid and borax, well dissolved in water as

hot as can be borne. The idea underlying this treatment is disinfection, with a complete alkalinization of the parts, while the heat and sharp impact of the stream stimulates the diseased cells to healthy action.

After reading this book, one can merely express surprise that so much time, money and personal endeavor are being spent in the search for a cure of cancer along surgical lines, when we have a non-surgical method capable of such results as Bulkley has attained. It were well for every surgeon, dealing with cancer, to read and ponder over this work, and apply its teachings in his daily practice. Surely there seems to be considerable evidence in support of its teachings.

DIETS FOR DIABETICS.

Diabetes Mellitus. A System of Diets. Diet Table I, Starch Free Diet, Qualitative List; Diet Table II, Minimal Fat, Starch Free, Measured Diet; Diet Table III, Minimal Fat, Starch Free, Weighed Diet; Diet Table IV, Low Fat, Starch Free, Measured Diet; Diet Table V, Low Fat, Starch Free, Weighed Diet; Diet Table VI, Accessory Diet, Rich in Carbohydrates. By HERMAN O. MOSENTHAL, M. D., Assistant Professor of Medicine and Attending Physician, New York Post-Graduate Hospital and Medical School. New York: Paul B. Hoeber, 1921.

The Allen (Starvation) Treatment of Diabetes. With a Series of Graduated Diets. By LEWIS WEBB HILL, M. D., Junior Assistant Visiting Physician, Children's Hospital, Boston; Alumni Assistant in Pediatrics, Harvard Medical School, and RENA S. ECKMAN, Dietitian, Massachusetts General Hospital, Boston, 1911-1916. With an Introduction by RICHARD C. CABOT, M. D. Fourth Edition. Boston: W. M. Leonard, 1921. Pp. vii-140.

Mosenthal presents a departure from the well known textbook form of sample diets for diabetics. It apparently serves two definite purposes. In the first place it gives the general practitioner a well selected range of different types of diets, from a qualitative as well as a quantitative point of view, which ought to meet the requirements of the most exacting. In the second place, the lists are arranged in pad form—fifty sheets to the pad—so as to enable one merely to detach the required sheet and present it to the ambulatory patient or nurse, thus saving a good deal of time in the somewhat tedious task of figuring out and arranging palatable as well as suitable diets for each particular patient, in the various stages of the disease. Ample space is also provided for any addition to the list which the individual physician desires to make. The diets are such as are generally employed in large hospitals and reputable clinics, where metabolic diseases, especially diabetes, are studied.

In an introductory pamphlet, a discussion of the desirability and the need of particular types of diets is presented. Thus, for example, the purpose of the simple starch free diet is to cover the wants of the mild diabetic, "who does not require a weighed or measured diet to maintain a sugar free urine, to control the disease." A qualitative list of foods is, therefore, to be employed. The measured diets, emphasize the principles of the modern treatment of the more advanced diabetics, "control of glycosuria and control of acidosis," by the careful quan-

tative curtailment of carbohydrates and proteins on the one hand, and fats on the other. Selections of "minimal fat, and low fat, starch free diets," which at the same time will cover a certain caloric requirement, are given. For all practical purposes, where rough means for measuring will suffice or are the only means available, tablespoonful or teaspoonful portions are employed in these particular lists. On the other hand, where the facilities for the accurate weighing of foods are at hand, weighed diets are described. Such will be of value in cases of acidosis, where the lowest possible amount of fat is to be administered for its control.

The other weighed diets are low fat, starch free diets, where restriction of protein is necessary to control glycosuria or where acidosis does not play a rôle, and fats need not be curtailed. In addition, so-called "accessory lists of foods rich in carbohydrates," to be employed where the patient's urine continues to be sugar free, may be selected from tables which are given in Diet List No. 5.

Of course, while such lists are of inestimable value, one must not forget that in the treatment of diabetes the employment of these diets should not only be resorted to following the examination of the urine alone, the presence or absence of hyperglycemia is of paramount importance and the examination of the blood sugar should not be disregarded.

* * *

Beginning with a chapter on details of treatment, Hill and Eckman proceed with a number of case reports and a series of diet tables. They go fully into the subject of food selection and preparation for the diabetic, and it should be of inestimable value to those who are using the Allen method of treatment. These diets have worked remarkably well in the Massachusetts General Hospital, according to Dr. Richard C. Cabot, who has written a most favorable introduction to the work under review.

The starvation treatment is so well known that it requires little description. The difficulties encountered in the management of the diet of patients have been the greatest objection to the Allen method, but it must be admitted that the diet tables and methods of food preparation mentioned by the authors have simplified the treatment in a great measure, and to this extent will help to popularize the starvation method. It is a little book that should be in the hands of every physician and nurse having in charge the care of diabetics under the Allen treatment.

NERVOUS DISORDERS.

The Problem of Nervous Breakdown. By EDWIN LANCELOT ASH, Doctor of Medicine. New York: The Macmillan Company, 1920. Pp. xii-299.

Nerves and the Man. By CHARLES LOOSMORE, M. A., Brown Scholar at Glasgow University. A popular Psychological and Constructive Study of Nervous Breakdown. New York: George H. Doran Company, 1921. Pp. x-223.

These two books conceal more truth than they reveal. Certain important facts here and there peep through but they get no chance to be really stimulating. The acknowledged purpose of the books is to produce a prophylactic and therapeutic effect and should be the only excuse for any books on the much talked of subject of nervous disorders. Confusion of statement and retracting of statement in

the first book, together with mere superficial descriptions of disorders, lack of pointed investigation into the symptoms and symptom groups mentioned, advocacy of measures ineffective to reach the source of readjustment, all militate against the claim of any practical value in this work. The lack of clearness which results, the misrepresentation of the etiological and therapeutic actuality of these disorders, makes the work harmful.

The writer begins by laying much stress on weak nerves and though a little later he states that the emotional impulses behind the physical nerves are the field in which the disturbances arise, before he has finished this first chapter he is back again upon his theme of weak and tired nerve tissue. More is heard of this when he comes to consider various factors which can be seen superficially to be playing a part in nervous breakdown but which he sets all out of proportion as causative factors by forgetting the dynamic activity and its disturbances as merely evincing themselves over the nerve fibres. His idea continues present in his use of the term neurasthenia to cover more than a multitude of phenomena which he fails to point out in a deeper etiology. Description and advice—those who work with the psychic troubles comprised under these forms of "nervous breakdown" know how futilely they are accepted and applied unless something more dynamic is grasped. Sometimes Ash touches upon the more profound facts of psychic adjustment and nonadjustment but he loses his advantage soon in his merely wordy talking about these things. He has chapters on morbid fears and doubts, hysteria, rest cure, on a number of matters in which a different point of view, dynamically from within out, would have cleared his own mind and brought his readers actual help.

What shall we then say of the talkativeness of the second book? This writer offers to aid others by granting to them a knowledge of the method by which he was cured. We fail to find it. It does not come out clearly in what he has written. He, too, has too much to say about the broken down machine. Energy for him gets out of the nerve cell and then we have to rest while it is being replenished. The ever shifting functioning of mind and body in the "capture, storage and release of energy" gets scanty attention in such a view. So do nervous or psychic difficulties and the most effective method of getting at them receive little enlightenment from such an attitude at the beginning of a treatise upon them. Neurasthenia is dragged in here, too, and it is even divided into "cerebral and spinal." Synonyms for it are given, "chronic enfeeblement of nerve strength," "functional nervous weakness of the spinal cord." Is the psychologist who is writing this book trying to throw a conciliatory morsel to the physiologist? He has quoted these terms from somewhere.

That is not all. His psychology in itself seems to have no dynamic flavor. It comes around from the outside. "A distinguished man of fine mental ability . . . hearing the sound of church bells . . . is moved to tears." Again "the soothing influence of colors, for example, are so real that we are convinced that it should be classed among the

curative methods of treatment in certain kinds of nervous trouble." (The grammatical construction is according to the text.) Loosmore denies for the most part the possibility of finding specific causes for these disorders. With such ignorance of his subject it is little wonder that one looks in vain for anything but fruitless platitudes, generalized descriptions and pretty phrases. He tells the sufferer not to talk too much, not to dispute, not to expend too much sympathy, how nice it is to be cheerful, to feel kindly, and so on. He has not told the nervous sufferer anything he does not know better than his teacher. How to bring all this about by getting at the source of why opposite conditions prevail in any life and why such advice is called forth, that important dynamic problem he has not entered into. This writer, too, strikes at some truths in what he says but he also has not known how to use them. One might smile at his lists of "don'ts" but the influence of such books, traps too often for the unwary who will try almost anything, is rather to be seriously deprecated. Not only does it offer the hungry stones for bread and sermons for fish, it confuses the psychologist and the physician who are seeking to understand these things. The call should be upon every one who would write of this subject to press into facts, satisfied with nothing less than clear thinking and then definite, direct presentation. The human race needs rousing from its indolence by which it seeks the easiest way out of immediate distress. It is prone enough to palliate rather than understand and set to work upon itself. Therefore it becomes worse than ridiculous to prescribe the *The Lady of Shalot* for a bedtime soporific. If one's unconscious energy refuses sleep why not try, say a page or two of Ibsen?

THE LOST GIRL.

The Lost Girl. By D. H. LAWRENCE. New York: Thomas Seltzer, 1921. Pp. 378.

Another stratum of Lawrence's mining town society is presented in this book. In fact, the mining town serves only to identify time, place, and setting for the usual small town family drama. The story records the life of Alvina Houghton, the child of a dreamy promoter, from shops to music halls via the usual mining flurry, and an invalid mother who felt herself above commerce. After twenty-five years of a completely genteel life Alvina, despairing of marriage and uneasy at the prospect of stagnation, plunges to the very core of all things different and becomes a maternity nurse. After this move she drifts, responsive to exotic experience, and slowly reaches completion by means of stages that seem on the surface impulsive, yet are not of her own volition. She is extraordinarily attuned to circumstance. The story ends as it begins, with the heroine awaiting what may come next, not choosing, protesting, or planning, but letting herself be swept whither chance takes her.

Lawrence has been able to conceal the pathological accuracy of his character sketches better in this book than in other recent contributions. We know his people. We recognize their ways and makeup without feeling called upon to confirm the exact-

ness of the author's knowledge. Most interesting of all is the subtlety of the title, suggesting the townspeople's opinion of Alvina, to which she is completely indifferent, and at the same time reflecting the flaw in her makeup—her inability ever even to know herself.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE ANGLO-AMERICAN FUTURE. By A. G. GARDINER. New York: Thomas Seltzer, 1921. Pp. 111

NOTES ON LIFE AND LETTERS. By JOSEPH CONRAD. Garden City, N. Y., and Toronto, Canada: Doubleday, Page & Co., 1921. Pp. x-262.

TUBERCULOSIS AND HOW TO COMBAT IT. A Book for the Patient. By FRANCIS M. POTTENGER, A. M., M. D., LL. D., F. A. C. P., Monrovia, Cal. St. Louis: C. V. Mosby Company, 1921. Pp. 273.

A HISTORY OF ASSOCIATION PSYCHOLOGY. By HOWARD C. WARREN, Stuart Professor of Psychology, Princeton University. New York, Chicago, and Boston: Charles Scribner's Sons, 1921. Pp. ix-328.

MORTALITY STATISTICS FOR 1919. Twentieth Annual Report of the Department of Commerce, Bureau of the Census. Sam. L. Rogers, Director. Washington: Government Printing Office, 1921. Pp. 616.

A FRENCH-ENGLISH DICTIONARY FOR CHEMISTS. By AUSTIN M. PATTERSON, Ph. D., Formerly Editor of *Chemical Abstracts*. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Ltd., 1921. Pp. xvii-384.

LE SUCRE DU SANG. Par R. LEPINE, Professeur honoraire à la Faculté de Médecine de Lyon; Correspondent de l'Académie des Sciences; Associé de l'Académie de Médecine Paris: Librairie Felix Alcan, 1921. Pp. iii-468.

NACHKRANKHEITEN DER RUHR. Von Professor Dr. H. STRAUB, Direktor der inneren Abteilung des Krankenhauses der jüdischen Gemeinde zu Berlin. Halle a. S.: Carl Marhold Verlagsbuchhandlung, 1921.

O. HENRY MEMORIAL AWARD PRIZE STORIES OF 1920. Chosen by the Society of Arts and Sciences. With an Introduction by Blanche Colton Williams. Garden City, N. Y., and Toronto, Canada: Doubleday, Page & Co., 1921. Pp. xvi-322.

MEDICAL ELECTRICITY, RÖNTGEN RAYS, AND RADIUM. With a Practical Chapter on Phototherapy. By SINCLAIR TOUSEY, A. M., M. D., Consulting Surgeon to St. Bartholomew's Clinic, New York. Third Edition, Thoroughly Revised and Greatly Enlarged. Containing Eight Hundred and Sixty-one Practical Illustrations, Sixteen in Colors. Philadelphia and London: W. B. Saunders Company, 1921. Pp. 1337.

PHYSICAL DIAGNOSIS. By W. D. ROSE, M. D., Lecturer on Physical Diagnosis and Associate Professor of Medicine in the University of Arkansas; Demonstrator of Clinical Medicine and Chief of the Medical Section of the Isaac Folsom Clinic; Visiting Physician Logan H. Roots Memorial (City) Hospital, Little Rock, Arkansas. Second Edition. Three Hundred and Nine Illustrations. St. Louis: C. V. Mosby Company, 1921. Pp. 736.

A TEXTBOOK OF PATHOLOGY. By ALFRED STENGEL, M. D., Sc. D., Professor of Medicine, University of Pennsylvania; Physician to the Pennsylvania and to the University Hospitals, and HERBERT FOX, M. D., Director of the Pepper Laboratory of Clinical Medicine, University of Pennsylvania; Pathologist to the Philadelphia Zoological Garden. Seventh Edition, Reset. With Five Hundred and Nine Text Illustrations, Many in Colors, and Fifteen Colored Plates. Philadelphia and London: W. B. Saunders Company, 1921. Pp. 1111.

Practical Therapeutics

Peptone Injection in Puerperal Septicemia.—E. Lévy-Solal (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, May 5, 1921) reports a case of apparently lethal septicemia in which two slow intravenous injections of ten mils of a five per cent solution of Witte's peptone, administered at three day intervals, were followed by recovery. Antistreptococcic serum, large amounts of camphor in oil and intramuscular injections of electrargol had been given without result. The first peptone injection was followed by headache, backache, and secondary fever, but no evidences of collapse, and within twelve hours the temperature was down to normal, remaining so for three days. The reaction after the second peptone injection was less marked. The procedure is considered well worth trying in desperate cases of puerperal septicemia.

Acute Inversion of the Uterus.—James L. Huntington (*Boston Medical and Surgical Journal*, April 14, 1921) says that acute inversion of the uterus, postpartum, can occur spontaneously. Insertion of the placenta in or near the fundus of the uterus seems the most probable etiological factor. Realizing the possibility of encountering the fundus weakened by being the placental site, great care should be exercised in expressing the placenta by pressure from above. Shock, whether accompanied by postpartum bleeding or not, demands immediate vaginal examination, unless the typical spherical fundus can be plainly felt through the abdominal wall. Where the diagnosis is made too late for manual reposition from below, immediate laparotomy and reposition by traction with direct transfusion, offers the best chance for a successful outcome.

A Critical Analysis of Twenty-one Years' Experience with Cæsarean Section.—J. Whitridge Williams (*Bulletin of the Johns Hopkins Hospital*, June, 1921) bases this analysis on 183 Cæsarean sections performed on 145 women in a series of approximately twenty thousand deliveries. There were 104 single and 79 repeated sections. The operations comprised 121 typical conservative sections, four extraperitoneal sections, one postmortem section, and fifty-seven Porro sections. All deaths, except one from hemorrhage, were due to infection. The net mortality was 3.45 per cent., or 4.07 per cent. in the conservative and 1.82 per cent. in the Porro sections. The indication for interference in nine tenths of the negroes and in six tenths of the white patients was disproportion due to contracted pelvis. In the blacks the varieties of rachitic pelvis were the predominant indication, as contrasted with the simple flat pelvis in the whites. Eclampsia and serious cardiac decompensation were the most frequent non-pelvic indications for operation. Cæsarean section is only rarely indicated in placenta prævia. The delivery of an asphyxiated child occurs less frequently than is generally believed. These statistics furnish proof that the old superstition that boys originate from the right ovary and girls from the

left, can be discarded. In concluding Williams states that Cæsarean section is not devoid of danger. He believes it is being abused throughout the country, and that if accurate statistics as to its results were available, it would be found accountable for many unnecessary maternal deaths.

The Use of Pituitary Extract and Scopolamine Morphine in Obstetrics.—Ross Mitchell (*Canadian Medical Association Journal*, May, 1921) comes to these conclusions: 1. That in carefully selected cases and under certain definite conditions both pituitary extract and scopolamine morphine injections are of marked value in obstetrics. 2. That when these conditions are not met with the results may be disastrous. Both are potent drugs and are not to be given lightly or unadvisedly. 3. That in times past the doses have been too large. Single doses of pituitrin should not exceed eight minims; doses of four or five minims are preferable. The total amount administered before the uterus is emptied should never exceed sixteen minims. In scopolamine morphine anesthesia the initial dose should not exceed one sixth grain of morphine or one fiftieth of a grain of scopolamine. In repeating the latter drug, not more than one two hundredth of a grain should be given. Morphine should not be repeated. 4. That scopolamine morphine anesthesia is more suited for use in hospitals than in private practice in homes.

Luteum Extract.—Adam P. Leighton (*American Journal of Obstetrics and Gynecology*, March, 1921) reports his experiences with corpus luteum organotherapy in over three hundred cases. In women presenting definite signs of ovarian deficiency, the use of thyroid extract in conjunction with corpus luteum enhances, accelerates, and perpetuates the effects of the latter. Where luteum alone has failed, addition of thyroid often yields satisfactory results. In lessened ovarian function increased activity of the thyroid, manifested in symptoms of hyperthyroidism, seems to be often but a compensatory action, to supply the necessary extra stimulus to the ovary. The author has used luteum and thyroid together in some cases of menorrhagia, where uterine, annexal, and other pelvic disease or tumor could be ruled out, usually with exceptional benefit. Luteum extract alone in premenopause menorrhagia caused a marked reduction in flow, and in the menorrhagia of ovarian cystic degeneration, usually a mitigation of the hemorrhagic tendency. Dysmenorrhœa is especially benefitted by luteum extract in the cases with excessive first day pain, with scanty discharge, suggesting an intense unrelieved congestion. The remedy must be used continuously for ten to twelve weeks before one may expect relief. Hyperthyroidism and even early exophthalmic goitre have been distinctly aided by corpus luteum, the former having perhaps been due to prolonged effort by the thyroid to compensate for previous deficiency of the ovaries. At the menopause luteum extract works best when

given continuously and early, i. e., when menstrual irregularity appears and the hot flushes, mental confusion, tremor, and hyperthyroid symptoms are first evident. Among over one hundred and fifty women given luteum extract solely for menopause symptoms, there were not over a dozen who could not report marked benefit, even to absolute relief. The longer its use had been put off, the poorer the results and the harder to gain control. To those women who during the menstrual life complain of so-called sick headaches of the frontal and temporal type with nausea and vomiting, which occur with peculiar periodicity at or about the time of menstruation, ovarian organotherapy offers much relief. Luteum is also indicated in chlorosis, as an adjunct to hematinics, and is especially beneficial where moderate hyperthyroidism exists. The functional amenorrhea of women in early adolescence or mid-menstrual life responds in a miraculous manner, and if obesity coexists thyroid is of inestimable value. In thyroid reduction cures the simultaneous use of luteum extract seems to obviate the attacks of profuse sweating, muscular weakness, tachycardia, nausea, and other vasomotor symptoms that occasionally follow thyroid treatment. Larger doses of thyroid are tolerated if given in combination with corpus luteum. It is important that the patient obtain a luteum product from recent, fresh material.

Coexistent Venous Hypertension, Acrocyanosis, and Ovarian Insufficiency.—Villaret, Saint-Girons, and Bosviel (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, July 7, 1921) report the case of four young women, aged seven-teen to twenty years, who had always had irregular menstruation and exhibited a marked cyanosis of the hands and slight cyanosis of the feet, with unmistakable edema and coldness of the tissues. These peripheral disturbances were much worse in winter, being followed by chilblains, which became ulcerated and were rebellious to ordinary treatment. One patient was markedly and two others moderately obese. None had any evidence of disease of the circulatory, respiratory, urinary, or nervous systems, yet all had distinct venous hypertension, the venous pressure being, respectively, sixteen, seventeen, twenty, and thirty-five centimetres of water, as against the normal twelve. The arterial pressure was normal in all, ranging from 120 to 150 millimetres of mercury. The acrocyanosis and venous hypertension in these cases is believed to have been due to ovarian insufficiency. Following ovarian organotherapy one of the patients showed increased regularity of menstruation, diminution of cyanosis, slight reduction of venous pressure and slight increase of arterial pressure. In another case the menstruation became regular and the acrocyanosis diminished under ovarian treatment. The menopause symptom group in older patients is not attended with acrocyanosis and venous hypertension, the condition described being seemingly restricted to young patients. Special attention is called to the fact that, as exemplified in these cases, high venous pressure is not confined to circulatory cases with heart weakness or hypertension without arteriosclerosis, but may occur instead as a result of endocrine disturbance.

Treatment of Placenta Prævia.—William B. Thompson (*Bulletin of the Johns Hopkins Hospital*, July, 1921) found in a series of ten thousand women admitted to the Johns Hopkins Hospital sixty-six cases of placenta prævia. A tabulation of the methods of treatment shows the following: Died undelivered, one; Braxton Hicks's version, two; rupture of membranes, two; Cæsarean section, two; admitted to second stage, eight; manual dilatation of cervix, fifteen; balloon, thirty-six. All of the thirty-six patients treated by rubber balloons recovered, and such treatment is considered eminently satisfactory.

Breast Infections.—Joseph L. Baer (*Surgery, Gynecology and Obstetrics*, April, 1921) concludes as follows: The influenza epidemics of 1918-1919 were largely responsible for the increase in breast infections following them, in the Michael Reese Maternity. The technic employed in this hospital conforms closely to that used in most of the clinics analyzed. These procedures were not varied during the periods of increased incidence of infection. This tends to confirm the view that the increase was in relation to the influenza waves. We believe it would be advantageous for the largest possible number of clinics to adopt a uniform procedure for the prophylactic treatment of pathological nipples, breast lymphangitis, and threatened abscess, preferably that favored by the largest group in each case.

Krukenburg Tumor of the Ovary.—Philip J. Reel (*Annals of Surgery*, April, 1921) states that the histogenesis of solid tumors of the ovary is always interesting and should warrant a careful investigation of each case encountered. This tumor is similar to that described by Krukenberg, but presents very strong evidence of being metastatic in origin. This bears out the more recent investigations which tend to prove that, in the vast majority of instances, solid tumors of the ovary are secondary to a primary tumor situated elsewhere in the body. It is possible for these growths to attain enormous proportions in the absence of clinical manifestations. A review of the literature reveals that they occur most frequently before the age of forty, and that they are more malignant in character than is sometimes stated.

Adenomyoma of Fallopian Tube.—Arthur E. Mahle (*Surgery, Gynecology and Obstetrics*, July, 1921) presents the following conclusions:

1. The term tubal adenomyoma is correctly applied to adenomyomata arising in the tube, since the origin of the glandular portion is from the mature epithelium of the tube.
2. The hypotheses of the origin of tubal adenomyomata from the Wolffian and Müllerian ducts are untenable.
3. Tubal adenomyomata are in every case associated with an inflammatory condition and probably are end products of the process of inflammation.
4. Some relation exists between sterility and the presence of adenomyomata of the fallopian tube.
5. There are some slight histological differences between tubal adenomyomata and those commonly found in the uterus, but this difference is most probably due to the place of origin and subsequent development and not to the etiological factor.

Pneumoperitoneal X Ray as an Aid to Gynecological Diagnosis.—Reuben Peterson and J. G. van Zwaluwenburg (*Minnesota Medicine*, July, 1921) summarize what has been so far accomplished by the combined clinical and x ray study of pelvic lesions, as follows: 1. The normal uterus with the tubes and ovaries can be clearly demonstrated by the pneumoperitoneal x ray plate. 2. Owing to the distention with gas the tubes are rather more clearly demonstrated where the inflation has taken place through the uterus than transperitoneally. 3. Irregularities of the uterus are quite as well or better made out by this method than by the bimanual method. 4. With the improved position (knee chest and Trendelenburg) the pelvis is shown clear of bowel coils; retention of such coils in the pelvis are proof that intestinal adhesions are present. 5. In some instances the diseased and enlarged appendices are better made out than by the most careful bimanual examination. 6. In certain cases of flaccid tubes, or where the tubes are plastered against the pelvic walls by adhesions, the x ray is more valuable than bimanual examination. 7. It is within the bounds of possibility that with improved technic and experience, pregnancy may be shown earlier than is possible by the examining finger. 8. The bimanual examination and the x ray plate after inflation of the pelvis are not antagonistic methods of diagnosis, and their value is enhanced if they are used in conjunction.

Action of Potassium Chloride in Nephritis.—L. Blum, E. Aubel, and R. Lévy (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, June 30, 1921) state that in nephritis with chlorine retention—hydropigenous nephritis—potassium chloride acts as a dehydrating agent, instead of increasing water retention, as does sodium chloride. It thus constitutes actually a diuretic remedy in these cases, its therapeutic effect in this direction being sometimes more pronounced than that of any diuretic agent hitherto used; it may, indeed, in some cases prove the only effectual diuretic. An edematous patient who fails to lose weight on a salt poor diet—which means a severe, rebellious nephritis—shows a marked reduction in weight when twelve to twenty-five grams of potassium chloride are added daily to the salt poor diet, and the same patient, if later given sodium chloride, will show a gain in weight. Comparison of the diuretic action of potassium chloride with that of theobromine and theophylline in hydropigenous nephritis is markedly in favor of the former. In a case of mixed nephritis in which potassium chloride was tried the patient likewise lost weight, but through sweating instead of diuresis. In hydropigenous nephritis, sodium chloride nearly always increases the albuminuria, whereas potassium chloride has no effect or causes an absolute decrease in it. In patients with a normal cardiovascular system potassium chloride in the amounts referred to has no effect on the heart, but where the circulation is weak it causes dyspnea, cyanosis, precordial oppression, often irregularities of rhythm or slowing of the rate, and reduction of blood pressure. To obviate these effects such patients should be tested at first with one gram doses, later increased to five or seven and a half grams.

The Diagnosis in Gynecological Cases.—A. C. Magian (*Clinical Journal*, April 20, 1921) concludes a long paper with the following points: The physical examination must be thorough and complete, and whenever necessary the patient ought to be anesthetized. Remember that very many gynecological conditions are due to venereal disease; therefore, test all discharges for gonococci, and obtain a Wassermann reaction from the blood to ascertain the presence or absence of syphilis. Examine the urine for albumin, casts, deposits and sugar.

Dry Labor.—F. A. Dorman and E. C. Lyon, Jr. (*American Journal of Obstetrics and Gynecology*, March, 1921), present an analysis of 270 cases in which rupture of the membranes occurred at least twelve hours before delivery. The total mortality among the infants was twenty-three, or eight and four tenths per cent., as compared with the general hospital mortality among infants of five and five tenths per cent. Obstetrical complications seem to be a cause of dry labor almost as frequently as dry labor is a cause of complicated labor. The length of the time the membranes are ruptured before labor is not an important factor either in prolonging labor or increasing morbidity or fetal mortality, but protracted duration of pains in dry labor greatly increased the morbidity and trebled the fetal mortality. The morbidity risk increased consistently in proportion to the number of vaginal examinations. Every vaginal examination in a patient with ruptured membranes is a dangerous procedure; the rectal touch should be employed as much as possible. Dry labor requires operative termination in one third of the births. The risks of breech labor are much greater if the membranes are ruptured early. The Cæsarean operation gave good results, despite the grave prognosis usually rendered in abdominal hysterectomy in dry labor.

Experimental Studies Following Oophorectomy.—Harold Bailey (*American Journal of Obstetrics and Gynecology*, July, 1921) reviewing the literature on metabolic studies after oophorectomy, implantation experiments, and the evidences of relationship between the uterus and ovaries, states that the metabolic studies tend to show a reduction both of the oxygen consumed and the carbon dioxide eliminated. The greatest reduction occurs some two or three months after the operation and when atrophic changes have probably occurred in the uterus. The experimental work must be considered inconclusive as regards the demonstration of a direct effect on the energy metabolism of the cell by an ovarian secretion. Experiments to ascertain the condition of the ovary after hysterectomy show that in young animals the ovarian development goes on in a normal manner. Work with adult animals would indicate that following hysterectomy no ovarian change may be demonstrated until after a three or four month period. Clinical gynecology offers proof that the menopause ensues notwithstanding that the ovaries remain, if the uterus is entirely removed, and that saving a portion of the uterine mucous membrane so that menstruation may occur prevents these symptoms. Transplantation of the ovary is of no value in relieving menopausal symptoms unless the uterus or part of it remains.

Proceedings of Societies

AMERICAN GYNECOLOGICAL SOCIETY.

Forty-sixth Annual Meeting, Held at Swampscott, Mass., June 2, 3 and 4, 1921.

The President, Dr. WALTER WILLIAM CHIPMAN, of Montreal, in the Chair.

The Fads and Fancies of Obstetrics; a Comment on the Pseudoscientific Trend of Modern Obstetrics.—Dr. RUDOLPH W. HOLMES, of Chicago, drew the following conclusions: 1. In safe and conservative hands maternal and fetal mortalities had decreased in private practice. 2. The maternal and fetal death rates, in hospitals, had not shown an appreciable decline in one hundred years. 3. The fact that the death rate among the emergency cases (i. e., those sent in by medical attendants) was over ten times that of regular applicants in the New York Lying-in Hospital was a reflection on the preliminary medical training of the profession. 4. Scientific investigation of antenatal pathology which would promote a prophylactic therapy would lower infant mortalities more than would the present attempts to do so by routine operative termination of labor. 5. A properly conducted prenatal clinic, combined with conservative conduct of labor, was a more certain method for securing declining death rates than promiscuous intervention. 6. Under normal conditions, spontaneous labor, aided by proper analgesia, was the safest way for mother and child. Inordinately applied operative interference increased the hazards of birth. 7. The authorities who had fostered a peculiar method of routine interference in all parturient women, with their imitators, had retarded the advance in obstetrical care, and were part contributors to the high American mortalities incident to childbirth. 8. It was a lamentable thing that properly controlled midwives would have less mortality than those who practise a routine intervention. 9. The proponents of operative cults had produced no evidence to show that their systems were more worthy, less risky, and promised a higher conservation of life than carefully watched spontaneous labor. 10. There were no more reasons why all parturient women should be operatively delivered than that all people should be inflicted with routine enemata or catheterization. 11. A medical fad should be discountenanced; precept and example founded on injudicious enthusiasm led to many unwise courses. 12. Indications for obstetrical operations demanded revision; certainly, they should be more clearly drawn, curtailed, rather than extended. 13. A wise conservatism in obstetrics would be more productive of ideal results than injudiciously used skill. 14. Obstetrical teaching was so deficient in most colleges that there should be a sharp and early improvement. So long as obstetrical teaching was defective, so long would results be bad in obstetrical practice. 15. An obstetrical curriculum should be devoted to practical instruction on the mannikin, in the class room, and in clinic; obstetrical surgery should be a very small

part of the coordinated whole. The proper place of the latter was in postgraduate courses intended for those preparing for the specialty.

Forced Labor.—Dr. JOHN O. POLAK, of Brooklyn, N. Y., stated that in two hundred cases of labor in contracted pelves, recently studied, he found that in eighty-one per cent. delivery was spontaneous, or the labor was terminated with low forceps. This certainly showed that each case of relative contraction was at least entitled to a proper test of labor before the abdomen was sectioned.

While the application of forceps to the engaged head in the presence of properly prepared soft parts was admitted to be a most valuable procedure, both in the interests of the mother and the child, when the fetal arrest was due to failing powers—it had its limitation of safety as a routine measure, and definitely increased trauma to the soft parts. Therefore, he felt that shortening the second stage by intervention with the forceps was not justifiable as a routine measure any more than eliminating the second stage and delivering every child whose head would come into the brim by elective version and extraction, with no other indication than to eliminate the second stage of labor and thus relieve the woman of the pains and agonies of childbirth, was safe teaching for the student or graduate without months or years of special training.

Furthermore, Cæsarean section was not without its morbidity and its mortality. Beck showed that there was a thirty per cent. morbidity in his study of one hundred and seven cases. Rupture of the Cæsarean scar was not an unknown possibility, and in his collective study of two thousand cases in which operation was performed by the leading operators throughout the country, there was a mortality of nearly ten per cent. and of over two per cent. in the elective group. Another procedure that should come up for consideration and comparison, was hurrying the third stage of labor by expression of the placenta with the first uterine contraction after the child had been delivered. This was definitely unphysiological in that it took time for the uterus, by its contraction and retraction, to separate and expel the placenta and produce proper uterine hemostasis. While this practice might be safe in the hands of the trained specialist, it was bad practice and bad teaching for the practitioner and for students.

Basal Metabolism in Pregnancy and the Puerperium.—Dr. JOSEPH L. BAER, of Chicago, drew the following conclusions: 1. The increased basal metabolic rate in late pregnancy was due to the growing demands of the fetal organism and placenta. 2. The incomplete or delayed return to normal was due to involution of the uterus and the onset of lactation. 3. Twin pregnancy should show a rate above the average for single pregnancy when both twins were well developed. 4. Thyroid enlargement might occur in pregnancy without increasing the basal metabolic rate above the averages ob-

tained in this series. 5. Differential diagnosis between uterine tumor and pregnancy would not be helped unless greater refinements in method showed increased rates much earlier than in this series. The x ray could be called on as early as the fifth month and with reasonable certainty in the sixth month.

A Comparison by Statistical Methods of Certain External Pelvic Measurements of French and American Women.—Dr. FRED L. ADAIR, of Minneapolis, Minn., drew the following conclusions: 1. The author appreciated fully the limitations of external pelvimetry, but also felt that the value of this method of examination might be increased by better methods of statistical study. 2. The racial and national pelvic differences should be more carefully studied and recorded so that observations made and conclusions drawn in one section of the world might not be applied too arbitrarily in other sections. 3. There were apparently definite pelvic differences, not only in different races, but in different nationalities. This was indicated by the earlier work of La Verneau and Vrolick. It was shown definitely by the work of Williams and his associates in comparing the pelvis of the negro with that of the white, by the studies of Emmons and De Souza, also by those of Acosta-Sison and Calderon. The present study also showed less marked, but none the less definite, indications of national as well as racial pelvic differences which were apparent even on external examination of the living subject. 4. It was obvious that much more accurate deductions could be drawn by more complete and extensive pelvic measurements. The author regretted that he had been unable to make these comparisons, but the conditions under which the work was done made it none too easy to secure the measurements.

Acute Malignant Endocarditis Complicating Pregnancy.—Dr. PALMER FINDLEY, of Omaha, Neb., reported the case of Mrs. B., aged thirty, para II, seen in consultation with Dr. Malcolm Campbell, of Malvern, Ia. She was seemingly in perfect health until early in her third pregnancy when she suffered from pains in ankles, hips and shoulder joints which her family physician diagnosed as rheumatic arthritis. The tonsils and teeth were not involved, but the nasal passages were occluded with mucopurulent secretions and incrustations which persisted and prevented her from breathing through the nose. This was the only focal infection discerned. She rapidly lost flesh and strength and became extremely anemic and nervous. There were repeated chills with an irregular course of fever ranging to 104° F. Shortness of breath and palpitation of the heart were recorded as early symptoms. The aortic and mitral valves were early involved and later the tricuspid as well. Blood cultures were taken and the *Streptococcus viridans* found. Precordial friction sounds were observed as a late development. The urinary findings were negative until near the end when the urine presented the usual findings of an acute nephritis and this was associated with uremic symptoms; death was preceded by coma and convulsions.

For practical purposes acute endocarditis was classified as simple and septic (malignant). These types probably represented varying degrees of the

same morbid process according to the virulence of the microorganisms and the resistance of the tissues. The clinical phenomena and anatomical changes did not differ essentially in the various etiological forms. The septic type was of special interest to the obstetrician in that it was not infrequently found in association with puerperal infections. Clinically, the septic form of acute endocarditis was distinguished from the simple type by the occurrence of chills, irregular course of fever, and the appearance of multiple emboli. Malignant endocarditis was always of bacterial origin and should be regarded as a local complication of a general infection. Because of the frequent association of acute malignant endocarditis with puerperal infections one found this type of cardiac lesion twice as frequent in women as in men. According to Lenhartz, twenty-one per cent. of all cases of septic endocarditis were of genital origin. It was rare that any other than the puerperal form of genital infection was complicated by septic endocarditis.

The Drudgery of Obstetrics and Its Effect Upon the Practice of the Art, with Some Suggestions for Relief.—Dr. BROOKE M. ANSPACH, of Philadelphia, stated that while the almost general and universal use of hospitals for obstetrical cases had infinitely lessened the drudgery of obstetrics, much was still to be desired in the direction of securing close cooperation between the obstetrical intern and the practising obstetrician. The obstetrical intern should not only be permitted, but should actually be trained to examine the woman in labor under his care. Indeed, before she entered the hospital, the patient should be made to understand that the practising obstetrician would call into cooperation with him the obstetrical intern. The obstetrician should be careful to write a full history and make complete and regular notes of visits and examinations during pregnancy, including the results of pelvimetry and the diagnosis of position, which should be sent to the hospital as soon as the patient went into labor. These notes, with perhaps a telephone conversation, would give the obstetrical intern the information he required. As a result, he would be better able to look after the patient during the early stages, and would summon the obstetrician when he was needed.

In the larger maternity hospitals fresh attendants might be provided throughout labor by a shifting staff of anesthetist, two nurses, and an obstetrical intern, every eight or twelve hours. If the period of labor of a patient continued beyond the time allotted to the staff on duty when he was admitted, the notes made by the first staff might be turned over to their successors. By this plan perfect analgesia throughout labor might be maintained by well trained attendants thoroughly awake to the necessities and requirements of the case. An elaboration and possibly an outgrowth of this plan would be the association of several obstetricians—men of approximately equal standing and experience in one maternity hospital. Instead of engaging a particular obstetrician to care for her, the patient would enlist the services of the group collectively, stipulating that she would be willing that any one of them should look after her, the choice depending upon the time of her delivery.

Vaginal Supracervical Hysterectomy for Cystocele and Procidentia Associated with Enlargement of the Uterus.—Dr. H. N. VINEBERG, of New York, drew the following conclusions: 1. In over one third of the cases of procidentia and cystocele the uterus was found too large to be adapted for interposition. 2. Decreasing the size of the uterus by excising a portion of the anterior wall or fundus had been found satisfactory on account of the rarity of obtaining primary union of the thickened and diseased walls of the uterus and the consequent high morbidity and mortality. 3. A much more advantageous procedure consisted in amputating the body of the uterus at the level of the internal os or higher up (if the patient was under forty years of age) and interposing the cervical stump.

The Interpretation of Vesical Symptoms in Gynecological Diagnosis.—Dr. F. E. KEENE, of Philadelphia, said that because of its intimate anatomical relationship with adjacent structures, the bladder often participates in the pathology of these organs, whether this be in the form of a displacement, neoplasm or infection. The vesical symptoms arising from such participation naturally varied in degree as well as kind, and depended primarily upon the nature of the pelvic lesion and secondarily upon the subsequent changes either within the bladder alone or in combination with the kidneys and ureters which might in their turn become involved.

Painful urination was usually the manifestation of an infection which might, with ease, be engrafted upon a chronic retention. Hematuria was rarely found in association with uncomplicated benign tumors and, when present, might be due to small varices in the bladder wall or to minute papillary excrescences of the mucosa in the immediate vicinity of the tumor, both incident to impaired circulation. Consequently, hematuria in association with a benign pelvic tumor should never be considered a secondary manifestation until proved so cystoscopically, for it usually signified a lesion in the bladder or kidney entirely independent of the pelvic lesion. Likewise pyuria, in the absence of an antecedent history of retention or evidences of an infected tumor, was an uncommon secondary event and its presence should be the indication for cystoscopic study to determine the exact nature and location of the infection.

Malignant tumors, especially carcinoma of the cervix, frequently produced vesical symptoms due to direct extension of the growth to the bladder or secondary to renal infection incident to incomplete occlusion of the ureters.

In the majority of cases of acute pelvic infection, associated vesical symptoms presented little or no difficulty of interpretation, being due to extension by continuity along the urethra or to direct contact between the bladder base and the diseased structures. Here, cystoscopic studies were not only unnecessary but often inadvisable. In the chronic cases, the presence of persistent bladder irritability was certainly an indication for such investigation to determine the nature and extent of the disease, whether it had arisen as a purely secondary manifestation or was a coincident lesion, independent of the primary pelvic infection and to what degree, if

any, the ureters and kidneys were sharing in the production of symptoms.

In conclusion, he could not emphasize too strongly the importance of making cystoscopic examinations in all gynecological cases presenting vesical symptoms, even though the condition might seem quite sufficient to explain these symptoms. Not infrequently, by such a plan, lesions would be discovered which were unsuspected and which were of more vital import than those of the pelvic organs.

Certain Dietary Factors in the Causation of Sterility in Rats, with Special Reference to the Histology.—Dr. EDWARD REYNOLDS and Dr. DONALD MACOMBER, of Boston, concluded provisionally:

1. A moderate decrease in the percentage of the fat soluble vitamins, of the proteid, or of the calcium contained in an otherwise excellent diet produced a definite decrease in the fertility of individual rats.
2. A slight decrease in the fertility of both partners would produce a sterile mating.
3. The fertility of the mating might be stated as the product of the fertility of the individuals concerned.
4. If the index so obtained fell below a given point the mating would be sterile, and this result held true whether the partners were of equal or of widely different fertility.
5. These principles explained the fact that two individuals, which were sterile when mated together, might nevertheless reproduce freely when mated to new partners (of higher fertility).
6. Dietary deficiencies produced a lowered fertility which varied in degree with different individuals though of the same parentage and in the same cage.
7. Diminished fertility sometimes resulted in the appearance of abortion.
8. Mere percentage deficiency in both proteids and calcium produced visible ill health and great infertility.

Pneumoperitoneum and Röntgenology as Aids to More Accurate Obstetrical and Gynecological Diagnosis.—Dr. REUBEN PETERSON, of Ann Arbor, Mich., drew the following conclusions:

1. The pneumoperitoneal x ray was a great aid to accurate obstetrical and gynecological diagnosis.
2. In suitable cases and with the proper technic gas inflation was free from danger.
3. The apparatus for gas inflation and pelvic röntgenography was simple and inexpensive and could be used in any obstetrical or gynecological examining room.
4. The method should not be used in cases of acute pelvic inflammation or when disturbances of circulation might arise from sudden abdominal distention.
5. Since carbon dioxide gas was absorbed within half an hour it was preferable to oxygen gas for inflation, since the latter gas might not be absorbed for days.
6. Whenever possible, the transuterine route should be chosen in preference to the transperitoneal for the introduction of the gas, because of the valuable information it furnished regarding the permeability of the fallopian tube.
7. Excessive quantities of gas caused great pain. Experience had shown that in the ordinary case one thousand c. c. of gas would cause only moderate discomfort and was sufficient for good röntgenograms.
8. With the proper position (partial knee chest with tilted table) and the ray directed perpendicularly to the plate in the axis of the pelvis the pelvic organs were clearly shown by röntgenography.

Hemorrhage from the Nonpregnant Uterus in the Absence of a Neoplasm.—Dr. WILLIAM A. SCOTT, of Toronto, Canada, discussed the histology of fibrosis uteri. The majority of cases were of the subinvolution type with thick walled, hard uteri, containing an excess of elastic tissue. It had been assumed that the bleeding also occurred from small sclerotic uteri as well as from the large soft organ. Moreover, the typical histological findings of fibrosis uteri were not constantly found in all bleeding cases, but might be found apart from bleeding. Therefore, it seemed probable that the bleeding was not dependent upon these histological changes. Glandular hyperplasia of endometrium was the most constant finding in cases of bleeding. Bleeding and hyperplasia were likely ovarian in origin.

Torsion of the Cecum, with Review of the Literature and Report of a Case.—Dr. SIDNEY A. CHALFANT, of Pittsburgh, said that volvulus of the cecum was possible only in patients with an abnormally mobile cecum and ascending colon. This type of volvulus was more common under thirty years of age and occurred in about one per cent. of all persons. The symptoms were those of intestinal obstruction. The treatment was surgical, the nature of the operation being determined by the extent of damage to the intestine and the condition of the patient. A case was reported in order to point out the fact that torsion of the cecum, while a rare condition, did occur and that it must be considered in making a diagnosis in obscure cases of intestinal obstruction. This was especially the case in patients presenting a history of obstinate constipation with previous attacks of severe pain in the upper abdomen.

Ovulation and Menstruation and Postoperative Considerations.—Dr. THOMAS J. WATKINS, of Chicago, stated that ovulation and menstruation as postoperative considerations were important because many of the pelvic operations affected these functions. The problem of the ovary relative to operative indications concerned the production of ova and corpus lutea. Unanimity of opinion existed relative to conservation of the ovary when conditions obtained which were favorable to reproduction. Opinions varied much in regard to conservation of the ovary for the purpose of production of corpus luteum. The corpus luteum during menstrual life had been proved to be an important part of the endocrine system. The physical changes that took place at puberty and the menopause emphasized the importance of the ovarian function. The usual good health which obtained after the menopause was completely established demonstrated the ability of the endocrine glands to compensate for the loss of the corpus luteum. Atrophy following the menopause was a problem of the greatest biological importance. Atrophy following the artificial was no more than after the natural menopause, but the latter was beyond our control. More or less atrophy necessarily followed loss of ovarian function, as growth and sustained growth required function. The loss of one lessened the other. Loss of the ovarian function necessarily caused atrophy in the tissues associated with it in function.

No clinical or theoretical evidence indicated that

excision of the fibroid uterus compromised the life or function of the ovaries unless they were so situated that the operation disturbed their blood or nerve supply. The menopause symptoms following hysterectomy with conservation of the ovaries, appeared about the usual time. The ovaries also remained normal in size, determined by conjoined palpation. It had been his custom for many years to leave the ovaries in favorable cases when excising the fibroid uterus. He had had no instances that raised the suspicion of an increased tendency of such ovaries to disease. He had no record of ovarian cysts developing in ovaries left after fibroid operations. It was reasonable that they should occur, but it had not been his experience to see them.

Dr. Watkins said that his experience in the treatment of small uterine fibroids with radium had induced him generally to limit the use of radium to patients past forty years of age; in younger women supravaginal hysterectomy had seemed preferable to destruction of the ovary by radium. The fact that with radium profuse bleeding occasionally occurred before amenorrhea was established, and that cessation of menses and arrest of growth were often temporary in younger women, was additional evidence in favor of supravaginal hysterectomy. The same evidence for and against conservation of the ovary in fibroids was applicable in case of salpingitis, except that in salpingitis the cortex of the ovary was modified by inflammatory reaction. Conservation of menstruation had no value aside from its relation to reproduction.

The Unsolved Problems in Gynecology and Obstetrics.—Dr. W. BLAIR BELL, of Liverpool, England, said that the object of his paper was to point out that, whereas in regard to clinical and surgical technic there was little room for improvement, our progress in regard to essential biological problems was slow. The question as to whether our present methods of education were likely to help the investigator was first considered. The tendency to minimize the importance of biology and to urge the superior claims of hospital study was unfortunate and probably was to some extent accountable for the present position. Today elementary gynecological anatomy and physiology were taught by the clinician and not by the anatomist and physiologist—at any rate, in Great Britain—and the result was that the anatomist and physiologist were unaware of the hiatuses in our knowledge. The man who had difficulties to face in practice would, if properly educated, be the person most likely to overcome them. The necessary improvements in educational methods were radical. The clinician should have the right to define the subject matter of the physiological and anatomical courses, and physiology should be taught more in coordination with clinical work. With regard to postgraduate work it seemed likely that the clinical unit and units for group study would give the best results. Some of the morphological and physiological problems were mentioned by way of illustration, such as development of genital ducts and atavisms, tuboovarian sacs, bony deformities of the pelvis, neoplastic developments, puberty, menstruation, and selective sterility.

(To be continued.)

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Miscellany.

Influence of Meteorological Agencies on the Propagation of Epidemics.—A. Prillat (*Bulletin de l'Académie de médecine*, April 26, 1921) states that studies he has been carrying on for several years have shown various meteorological agencies and the chemical composition of the air exert independent effects upon the conservation, displacement, and multiplication of microbe laden droplets in suspension in the air. The rate at which these droplets fall, which is about one centimetre in ten minutes for droplets one micron in size, varies with the temperature. The barometric pressure exerts two different effects according to whether it is changing abruptly or slowly. Moisture acts differently on the vitality and multiplication of bacteria in the air when present in the state of vapor from what it does when present in droplets. This condition depends particularly on the supersaturation of the air, which in turn depends on the temperature, but it may likewise occur in an incompletely saturated and relatively dry air under the influence of certain factors such as a sudden atmospheric depression and the radioactivity of the soil. Aside from the influences of light temperature, humidity, electricity, superficial tension, etc., the chemical composition of the air, to which germs are exceedingly sensitive, and its microbic flora, which markedly influences their vitality, have also to be taken into account. Freshly expired air is an extremely favorable medium for epidemic propagation, although germs are not actually discharged in it unless the vocal cords or pharyngeal or nasal mucous membranes are in vibration at the time. A curve of the relative—not the absolute—humidity in France and Central Europe during the influenza epidemic of 1889-1890 closely parallels

the course of the epidemic. Sudden depressions of barometric pressure facilitate the multiplication of germ laden droplets. Such depressions may occur even when the general tendency of the pressure is upward.

The *Medical Press*, June 1, 1921, comments editorially on the observations made by Prillat which more or less discount the generally accepted views upon aerial dissemination of infection. He submits that the proliferation of pathogenic organisms suspended in the air is chiefly affected in dust which is moist and not in dust which is dry. The deleterious influence of the latter in this connection, he holds, has been greatly exaggerated, while moist dust enables the organisms to maintain their virulence and proliferation, especially when the temperature, the radioactivity, the humidity of the air, are favorable for this purpose. Reasoning from these premises, it is pointed out that air expired from the lungs contains all the conditions requisite for the propagation of infection. The air is warm and moist, and it is expelled under pressure during speaking, and in the course of the expiratory effort. In support of his views Prillat exhibited some diagrams showing the progress of the influenza epidemic in France during 1889-1890, and in Central Europe, and it was evident from these that a direct relationship existed between the mortality and the statistics recording the aerial temperature and the relative humidity. The suggestion is made that, having regard to the connection between meteorology and epidemiology, steps should be taken to devote more attention to the subject than has hitherto been the case.

Dangers of Radium to Persons Other than the Patient.—H. Bordier (*Bulletin de l'Académie de médecine*, April 26, 1921) states that the person most exposed to the harmful effects of radium are the orderlies constantly in attendance in wards in which a number of patients are receiving radium treatment. These orderlies are being constantly subjected over their whole bodies to a certain amount of radium radiation. Three cases of pernicious anemia followed by death from this cause among nurses of the Radium Institute of London have recently been reported. Physicians run much less risk unless they remain for hours in the wards or private rooms. Chemists who prepare and handle radium salts are much exposed to induced radioactivity and radium emanation in spite of the use of leaden shields over the chest, more or less impervious gloves, and opaque glasses. To protect the nurses the beds of patients under radium treatment should be surrounded by thick sheets of lead nailed to screens and high enough to shield the heads of persons near the beds. The danger from radium emanation and induced radioactivity could be overcome by using only hermetically closed metallic tubes. Since, however, there would still remain a possible danger from secondary rays, it seems advisable that the nurses should spend as little time as possible in the ward. Chemists should be warned of the risks to which they are exposed, in order that they may take proper precautions. A red blood cell count should be made every two or three months in all persons whose occupation necessitates exposure to radium.

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The Treatment of Premature Loss of Hair

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INTRODUCTION.

As a general rule, both men and women dislike to lose their scalp hair. In many instances a marked loss of hair and, in some instances, even a slight loss, will cause great worry and anxiety. Most men, when threatened with baldness, will depend upon the druggist or barber for relief. Women usually follow the advice of hair dressers and beauty specialists. Proprietary hair tonics and the remedies used by barbers, hair dressers and beauty specialists are often efficacious preparations, but the failure to obtain the desired result is due largely to inability to recognize indications and type characteristics. In other words, a hair tonic or a treatment that is proper for one patient may be inefficacious or even injurious for another patient. There cannot be a successful routine treatment for alopecia. Each case must be properly diagnosed and treated according to indications.

There are four reasons why people who suffer from premature loss of hair consult barbers, beauty specialists, hair specialists and hair dressers.

1. Because they do not consider the condition to be of much importance, or they hope to save money. It might be interjected that in the end many such persons spend considerably more than they would have spent if they had consulted a physician.

2. Because the family physician takes little interest or does not know what to do.

3. Because the patient does not know that dermatology is a medical specialty, and that it embraces diseases of the cutaneous appendages, including those of the scalp and hair. Unfortunately, the word dermatology has been abused, and many people do not appreciate the difference between the ethical medical specialist and the lay or medical quack who illegitimately appropriates the term dermatology or dermatologist.

4. Because many dermatologists do not like to treat alopecia. Various dermatologists have different reasons for this attitude. At times it is purely a matter of indifference on the part of a busy man.

It may be simply a lack of interest. Usually it is caused by pride. A dermatologist dislikes above all things to be confused with hair specialists and beauty specialists.

General medical practitioners are often consulted by patients for advice relative to loss of scalp hair. We have been informed by many physicians that they feel helpless and for this reason embarrassed when consulted for this purpose. They state that they are unable to obtain the desired information from textbooks and journals. They aver that the textbook is overwhelming in detail, or that it is too concise, or that the sequence opposes prompt visualization of the entire subject. The object of this article is to help the patient through the family medical adviser. The contents, sequence, etc., are arranged in a manner that in our opinion will provide the busy general practitioner with the necessary information with the smallest amount of effort on his part.

CLASSIFICATION.

Alopecia (loss of hair) is divided into a number of clinical entities. When one uses the noun alopecia without a qualifying adjective, it signifies what is known as alopecia prematura—premature loss of hair. This form of alopecia is subdivided into a number of types, and before the affection can be intelligently treated one must become acquainted with the characteristics of each type. The subdivisions are as follows:

1. Alopecia symptomatica.
2. Alopecia idiopathica or hereditaria.
3. Alopecia seborrhœica.

The last (alopecia seborrhœica), as its name implies, is associated with seborrhea, which may be of the dry, waxy or oily type. The nomenclature of alopecia seborrhœica is a little confusing because of the different classifications of the French and German schools. The Germans divide seborrhea capitis into the dry and oily types—seborrhea sicca and seborrhea oleosa. The French substitute the word pityriasis for seborrhea. Hence we have pityriasis simplex capitis instead of seborrhea sicca. Sebor-

rhea oleosa appears in the French classification, but they recognize a transitional waxy stage which they designate pityriasis steatoides.

In addition to premature alopecia, we have alopecia senilis, alopecia arcata, and a number of miscellaneous forms of alopecia, such as loss of hair from x rays or radium; from local diseases, such as favus, ringworm, monilethrix, lupus, furunculosis, and granuloma fungoides; alopecia traumatica, alopecia cicatrisata, alopecia syphilitica, etc.

This article deals with only those forms of alopecia that are of daily occurrence—alopecia prematura, alopecia senilis, and alopecia arcata.

SYMPTOMATOLOGY AND PROGNOSIS.

Alopecia symptomatica.—This type of alopecia is coincident with or subsequent to a systemic affection, such as typhoid fever, pneumonia, scarlet fever, influenza, and similar diseases. It also accompanies excessive worry, severe mental strain, nervous exhaustion, pregnancy, surgical operations, and physical and mental shock.

The principal symptom is falling of the hair, which may range from a slight to a severe degree. After febrile affections, such as influenza and other acute conditions, the hair may not begin to fall for two or three months, and then, within a month or two, one half or two thirds of the hair may fall out. When caused by a gradual loss of nerve tone subsequent to worry or prolonged emotional excitement, the defluvium is less rapid but more persistent.

In uncomplicated cases there is no evidence of inflammation—no erythema or exfoliation. The hair and scalp are usually dry, but in some instances the parts may be excessively oily. The patient may complain of pain or tenderness when the scalp is palpated or the hair is brushed. At times this symptom is so marked that the patient cannot tolerate even slight pressure on the scalp.

One of the principal diagnostic symptoms is that the hair falls out equally over the entire scalp—there are no sites of predilection. Very frequently the hair lacks lustre; it is dry, brittle, and breaks off. In fact, the splitting and breaking of the hair may be the chief symptoms, especially in alopecia due to nervous affections. While at times the scalp may be congested, it is usually rather pale.

The prognosis depends upon the cause. When subsequent to acute systemic conditions the prognosis is excellent, even without treatment. When associated with chronic systemic disorders, the prognosis is favorable if the patient receives adequate treatment. If the alopecia and the systemic condition has existed for several years, a guarded prognosis should be given.

Alopecia idiopathica.—In this type of alopecia there is a gradual loss of hair without discernible cause. The hair not only falls out, but it ceases to grow. In a large percentage of cases there is a family history of baldness. Without a family history of alopecia, it is possible that a patient with idiopathic baldness is the first member of a family tree. The affection seems to be more common in males than in females. It usually begins in late adolescent or early adult life. Baldness may be complete in from three to five years, or not for ten to twenty.

The local symptoms are characteristic. If un-

complicated, there is no evidence of disease of the scalp. There is a gradual thinning of the hair of the temporal and vertex regions. Later the hair is thinned over the entire top of the scalp. For a while lanugo hair continues to grow and some large hairs persist, but eventually the top of the scalp is denuded. The hair below the parietal and vertex regions remains unaffected, as a rule.

The prognosis is almost hopeless. As a rule, the most that can be accomplished by treatment is to delay the process and to stimulate the growth of lanugo hair. Occasionally an unexpected and brilliant result is obtained in early cases.

Alopecia seborrhœica.—This form of alopecia is caused directly or indirectly by seborrhœic dermatitis and the latter is undoubtedly a bacterial or parasitic affection. Let it suffice for our purpose to say that alopecia seborrhœica is a contagious, bacterial affection. It is an exceedingly common affection in both males and females.

A classical case begins in late adolescent life (or at any time of life) as dry dandruff with perhaps some itching. The hair may or may not fall; usually there is little if any defluvium during the first stage (pityriasis simplex; seborrhœica sicca). After a few months or a few years, usually the latter, the scales become waxy and heavy. They no longer fall on the coat collar, but adhere loosely to the scalp or to the hair. Patients at the beginning of this stage (pityriasis steatoides) think they are improving because the dandruff is no longer conspicuous. As a rule the hair begins to fall at the end of the first stage or at the beginning of the second stage. At first new hair grows almost as fast as old hair falls, but sooner or later there is a noticeable thinning which is usually, but not always, first manifested over the temporal and vertex regions.

The third stage develops insidiously, after an interval which ranges from several months to as many years. In this stage, exfoliation is overlooked unless the scalp is carefully examined. The dandruff, macerated in oil, is but a waxy or oily deposit on the scalp. By this time there is a paucity of hair all over the scalp above the parietal and occipital regions, and there is little tendency for new hair to grow.

During the first stage the hair is dry and it may be brittle and lustreless. In the second stage it may be dry, but it is more likely to be oily. Toward the end of the second stage, and in the third stage, the hair becomes excessively oily two or three days after washing. In spite of the oil, however, the hair may split and break off, in addition to falling out. There may be more or less redness of the scalp. Also, the converse may be true—the scalp may be pale. The three stages may be of about equal duration, or any one stage may be greatly lengthened or shortened. The disease may never progress beyond the first or second stage; it may begin as the second or third stage, or antecedent stages may have been transient or overlooked. These are important facts and must be kept in mind while making a differential diagnosis.

The prognosis depends upon the stage and rapidity of evolution. In the first stage it is excellent. It

is good, but must be guarded in the second stage. In the third stage, the prognosis is unfavorable. If the disease has resulted in atrophy and baldness, the hair will never return.

Alopecia scnilis.—As the name implies, this is partial or complete baldness due to normal or premature senility. The scalp shows no evidence of disease, although it may be congested. It is more likely to be pale and shiny. The loss of hair is usually equally distributed over the scalp, especially above the parietal and occipital regions. The affection is slowly progressive and the prognosis is unfavorable.

Alopecia arcata.—While the etiology of alopecia areata is in dispute, the consensus of opinion is that the affection is caused by a peripheral or central nerve lesion of some kind. The sites of predilection are the scalp and bearded region. In some instances every hair of the entire body may fall out. It seems a paradox to say that alopecia areata can be alopecia universalis, but such is the case.

The usual picture is a sudden and complete loss of hair, in one day or one night, from an area the size of a dime or a silver dollar. There may be but one patch, or there may be several patches. Several areas may develop simultaneously, but the patches are more likely to be numerically progressive. The entire scalp may be denuded (alopecia totalis), or the entire body (alopecia universalis). The disease affects persons of all ages.

In mild cases with one or a few patches, the prognosis is good. In more extensive cases, the prognosis should be guarded. In alopecia totalis and alopecia universalis the prognosis is bad, but there are numerous instances of complete and spontaneous restoration of hair.

Combined types.—Almost any combination of types may occur. A common combination is idiopathic and seborrheic alopecia; also seborrheic and senile alopecia. Combinations of types must be recognized in order to prescribe proper treatment and to predict the probable result.

Examination.—It is important to make a careful local examination. If the patient is a woman, the hair should be let down. In any case the scalp should be carefully inspected after obtaining the subjective symptoms and past history.

The features to be looked for are scaliness (dry, waxy or oily exfoliation), readiness with which the hair pulls out, congestion, paleness, site of predilection, atrophy, thinness or thickness of scalp, tight or loose scalp, dry or oily hair and scalp, evidence of spontaneous regeneration of hair, splitting and breaking of hair, lustre or lack of lustre, and nodosities on the hairs.

The scalp and hair should not be washed for one week previous to the examination, and should be free of ointments and chemical residues from hair lotions. The normal scalp, like the entire cutaneous envelope, is constantly shedding its horny layer. If the scalp has not been washed for two or three weeks, there is likely to be a little dandruff, but this should not be mistaken for pathological exfoliation. Normal scalps differ somewhat in sebaceous activity. Some normal scalps (and hair) will not become oily for many weeks; others will be oily in a week or

two. These facts should be taken into consideration when making a diagnosis.

TREATMENT.

We will first review and discuss the various methods of treatment, and, later, endeavor to indicate selective treatment for individual patients.

Topical remedies.—The remedies used are numerous. The chemicals commonly employed can be divided into three groups:

- | | | | |
|------------------|---|---|--|
| 1. Stimulants. | } | Some are irritants and some are slight antiseptics. | tar
chloral hydrate
cantharides
formic acid
resorcin
betanaphthol
quinine
pilocarpine |
| 2. Antiseptics. | | | |
| 3. Keratolytics. | } | seldom used. | salicylic acid
potassium hydrate
sodium hydrate |

Ointments and lotions.—Ointments and lotions have advantages and disadvantages. Ointments will permit the application of insoluble chemicals. They permit a more lengthy application; that is, they keep the chemicals in contact with the scalp for days. It is probable that grease softens the horny layer and permits a deeper penetration. The disadvantages of ointments are that, if strong, they are likely to effect congestion; and they are disagreeable and troublesome, especially for women.

In lotions, one is limited to the use of soluble chemicals, unless an emulsion or a suspension is employed. The effect is rather evanescent, but, inasmuch as they are easily and quickly applied and need not be disagreeable, they may be employed frequently. The effect is probably more superficial than the effect of ointments.

Many women apply lotions by means of a brush or a piece of flannel—a laborious and time consuming method. A much better way is as follows: Use a medicine dropper of a length sufficient to extend to the bottom of the bottle. The lotion is applied to the scalp by inserting the patulous end of the dropper under the hair and forcing a little of the lotion upon the scalp. It requires only a few minutes to wet the entire scalp. Then the scalp is rubbed well with the fingers. It does no good, but harm, to apply the usual chemicals to the hair. It is the scalp, not the hair, that should receive treatment. Women object to wetting the hair; men do not. Therefore a man may pour the lotion on the scalp, wetting both the hair and the scalp, after which the scalp is rubbed well with the fingers.

Resorcin and betanaphthol must never be used when the hair is white, and with extreme caution when it is golden or light brown. A single application of a lotion containing either of these remedies may turn white hair to a yellow, green, or yellowish green color. The color cannot be removed. Light brown and golden hair is affected more slowly and sometimes not at all. It may change to green, yellowish green or, more commonly, auburn. As a

matter of fact, these chemicals must be used cautiously when the hair is any color but black or dark brown. Even in dark hair the patient should be instructed to watch for color changes. Both resorcin and betanaphthol may discolor the finger nails and make the skin of the fingers exfoliate. If this happens, the lotion must be applied to the scalp with a brush.

Idiosyncrasy not infrequently prohibits the use of one or more of the chemicals numerated above. Idiosyncrasy to resorcin, iodine, sulphur and mercury is not uncommon, and if a chemical to which the patient is idiosyncratic is employed, the result may be eczema of the face and hands. It is well to bear in mind that when a patient is idiosyncratic to an element, the effect is the same regardless of the chemical combination, and the name of the chemical may not suggest all the elements contained therein. For instance, we have seen a severe dermatitis (eczema) caused by a hair tonic containing sulphocarbolate of zinc in a patient who was idiosyncratic to sulphur. The same is true of sozoiodolate of soda or zinc, the mercury preparations, and similar substances.

Formula.—We will place several prescriptions here and number them. Later they will be referred to by number. In this way repetition will be avoided.

I. OIL LOTION AND BRILLIANTINE.

Olei ricinidr. 2
Dactylis or olei myrciægtt. 5
Spts. vini rect, 80 per cent., q. s. ad.....oz. 4

M.

II. MERCURY OIL SUSPENSION.

Hydrargyri ammoniatigr. 20
Hydrargyri oxidii rubrigr. 10
Olei rosæ ger. or olei myrciæ.....ᵐ 10
Olei olivæoz. ½
Liquidi petrolati, q. s. ad.....oz. 2

M. and S.: Shake well before using.

III. SULPHUR OIL SUSPENSION.

Zinci sulphatisgr. 10
Sulphuris præcipitatidr. ½
Quininæ sulphatisgr. 15
Ol. rose gr. or olei myrciæ.....ᵐ 10
Olei olivæoz. ½
Liquidi petrolati, q. s. ad.....oz. 2

M. and S.: Shake well before using.

IV. MERCURY OINTMENT (MILD).

Hydrargyri ammoniatidr. 1
Olei amygdalæ amaræᵐ 1
Adepis lanædr. 2
Petrolati albi, q. s. ad.....oz. 1

M.

V. MERCURY OINTMENT (STRONG).

Hydrargyri ammoniatidr. 1
Hydrargyri oxidii rubri }
Acidi salicylici } āā.....gr. 15
Olei amygdalæ amaræᵐ 1
Adepis lanædr. 2
Petrolati albi, q. s.....oz. 1

M.

VI. SULPHUR OINTMENT.

Sulphuris præcipitatidr. 1
Acidi salicylicigr. 15
Olei amygdalæ amaræ.....ᵐ 1
Adepis lanædr. 2
Petrolati albi, q. s. ad.....oz. 1

M.

VII. STIMULATING LOTION (BRUNETTE).

Resorcindr. 2
Betanaphtholgr. 10
Spts. vini rect.....oz. 2
Aque, q. s. ad.....oz. 8

M.

VIII. STIMULATING LOTION (BLOND OR BRUNETTE).

Capsicinegr. 1
Tincture cantharidesoz. ½
Chlorali hydratidr. 1
Quininæ hydrochloridægr. 15
Spts. vini rect.....oz. 2
Aque, q. s. ad.....oz. 8

M.: Filter.

IX. MERCURY LOTION (BRUNETTE).

Same as VII, with the addition of:
Hydrargyri chloridi corrosivi.....gr. 3

X. MERCURY LOTION (BLOND).

Same as VIII, with the addition of:
Hydrargyri chloridi corrosivi.....gr. 3

XI. SULPHUR LOTION (BRUNETTE).

Same as VII, with the addition of:
Zinci sulphocarbolaticdr. 1

XII. SULPHUR LOTION (BLOND).

Same as VIII, with the addition of:
Zinci sulphocarbolatisdr. 1

XIII. OIL MERCURY LOTION.

Hydrargyri chloridi corrosivigr. 1
Chlorali hydratidr. 1
Spiritus acidi formicidr. 2
Olei amygdalæ dulcædr. 3
Aque calcis, q. s. ad.....oz. 4

M.: Emulsify with quillaja. Add perfume or deodorant to hide odor of formic acid.

XIV. OIL RESORCIN LOTION.

Hydrargyri chloridi corrosivigr. 1
Resorcindr. 1
Olei amygdalæ dulcædr. 3
Aque calcis, q. s. ad.....oz. 4

M.: Emulsify with quillaja.

XV. SOLID SHAMPOO.

Thymoldr. ½
Saponis mollis, q. s. ad.....oz. 4

M.

XVI. LIQUID SHAMPOO.

Thymoldr. ½
Sodii carbonatisgr. 10
Tinct. saponis viridis, q. s. ad.....oz. 8

M.

XVII. MERCURY SHAMPOO.

XV or XVI, with addition of:
Hydrargyri chloridi corrosivi.....gr. 2

XVIII. SULPHUR SHAMPOO.

XV or XVI, with addition of:
Sodii boratisgr. 10
Sulphuris præcipitatisgr. 20

XIX. TAR SHAMPOO.

XV, XVI, XVII, or XVIII, with addition of:
Olei cadinidr. ½

XX. DRYING POWDERS.

Pulveris orisdr. 7
Sodii boratisdr. 3
Amyli (rice)dr. 2
Ol. violet, q. s. ad pleasant odor.

Some people prefer perfume in the hair lotion or pomade; others desire a pleasant odor without per-

fume, while others object to the addition of perfumes and deodorizers. For men, six drops of oil of bay or six grains of eucalyptus may be added to eight ounces of hair lotion; for women, five drops of dactylis or two drops of oil of violet for a similar amount of lotion. Ointments and suspensions may be made pleasanter by the addition of one or two drops of bitter almond oil, or two grains of eucalyptus, to the ounce. The thymol in the shampoos provides an agreeable odor, so no addition is necessary for this purpose.

It is well to see that the prescriptions are properly filled. The ointments made by some druggists are a disgrace to the art. Many patients prefer oily suspensions to ointments, because the former can be quickly spread over the scalp by means of a medicine dropper. Also in this way less grease will be deposited on the hair.

Sulphur and mercury must never be used at the same time, otherwise a deposit of black sulphide of mercury will form on the hair, scalp, forehead and fingers. If one happens to use a hair lotion containing sulphur, the shampoo, oil suspension or ointment, if employed by the same patient, must not contain mercury, and vice versa. In instances where oil is especially indicated—dry hair and scalp—it is preferable to use an ointment or oily suspension and a lotion rather than combine the two, especially in women. If the two are combined and the lotion is frequently used, the hair is likely to become too oily in a few days.

Electrotherapy and actinotherapy.—The unipolar, high frequency current, administered by means of a vacuum electrode or a carbon filled glass electrode, is of value in recalcitrant cases. The electrode should be kept moving rapidly over the scalp for about ten minutes, or until an erythema or hyperemia is established. Two or three applications a week are desirable.

Ultraviolet rays—Kromayer or Alpine lamp—are also of value in obstinate cases, the exposure being sufficient to effect an erythema. One or two applications weekly are sufficient. Sun bathing—an hour or two daily—may prove of benefit.

Massage.—Massage with the fingers or with an electrical (mechanical) vibrator, daily or three times weekly, is of service in stubborn cases. Massage can be administered to an efficacious degree by the patient in the following manner: Place the elbows on a table and bend forward so that the head is between the hands. The scalp should then be manipulated and rubbed for ten or fifteen minutes.

Hygiene.—The practitioner will be requested for advice relative to washing and brushing the hair. We are of the opinion that daily brushing in most cases is beneficial. If the hair is very dry, brittle, and breaks readily brushing is perhaps harmful. We are also of the opinion that the hair and scalp should be kept clean. The frequency with which these parts should be washed will depend upon conditions. As a general rule a shampoo should be given once weekly. Castile soap will answer most of the requirements. This question will be discussed in greater detail under treatment of the separate entities. Because seborrhea of the scalp is contagious patients should be instructed to avoid

any but their own tonsorial articles and to keep such articles in a sanitary condition.

Susceptibility and reinfection may be the cause of many failures in cases of seborrheic alopecia. Certain it is that most patients who have once had seborrheic alopecia will have repeated attacks throughout their lives. Such people should keep an antiseptic and stimulating hair lotion on their dresser and at the slightest evidence of trouble begin to use it. People who have trouble with their hair must take good care of both hair and scalp all their lives. Such prophylactic treatment consists of keeping the scalp and hair clean with castile soap, avoiding reinfection as far as possible, keeping the scalp loose from the skull, avoiding excessive dryness by applying oil, and using an antiseptic lotion once or twice weekly.

Physicians should watch for congestion of the scalp. If the congestion is not the effect of treatment, it will usually disappear as a result of treatment. If, however, it is due to overtreatment, all stimulating treatment should be discontinued until the congestion disappears.

TREATMENT OF TYPES.

Alopecia symptomatica.—After loss of hair from acute diseases, such as influenza, the hair will usually be restored to normal within a few months, but it is unwise to depend upon spontaneous recovery. The daily application of prescription VIII will usually suffice. If the hair is dry prescription I may also be used, or prescription XIII may be used alone. The hair should be washed once weekly with castile soap.

In the more stubborn cases, associated with nervous exhaustion, prescription VII or VIII will be found more efficacious. The patient should be urged to use one of the oil suspensions or ointments, two or three times weekly or at least the night before the shampoo.

High frequency electricity, sunlight or ultraviolet treatment, and massage are indicated. It is essential that everything possible be done to improve the general health of the patient.

Alopecia idiopathica.—If the scalp is bald there is no use in attempting to restore the hair. In early cases massage, sun bathing, high frequency treatment, and ultraviolet therapy will help to delay the process. Prescription VII or VIII should be used daily. If there is evidence of a combination of idiopathic and seborrheic alopecia, it is preferable to use prescription IX, X, XI, or XII. The hair and scalp should be kept slightly oily with vaseline or prescription I, or any of the suspensions or ointments may be used. Prescription XIV will be found useful in uncomplicated idiopathic alopecia. The scalp may be washed once weekly with castile or tar soap.

Alopecia senilis.—The treatment is the same as that advised for alopecia idiopathica.

Gray hair.—Gray hair may be senile, or if pre-senile, it may be hereditary or due apparently to a low tone to the nervous system or poor local circulation. There is no cure for gray hair. The indications are to improve the patient's general hygiene and general health, special attention being given to the nervous system. Locally, all evidence of disease

of the scalp should be removed if possible. Massage, stimulating topical remedies, ultraviolet therapy, sun bathing and high frequency therapy are useful to effect a good circulation.

Alopecia areata.—There is a difference of opinion among dermatologists as to the necessity of treating alopecia areata. Some aver that there is either a spontaneous recovery or no recovery—in other words, that treatment is practically useless. This is a minority opinion. We are inclined to agree with this opinion in so far as it concerns alopecia totalis or alopecia universalis, but not in common alopecia areata.

If there are one or a few more patches of baldness, the individual patches, if on the scalp, may be painted with pure carbolic acid; as soon as the treated area has turned white, alcohol may be applied. If on the face, alcohol should be applied before the white color appears. These applications may be repeated once or twice a week depending upon the degree of reaction provoked. All evidence of reaction should disappear before making the next application. Tincture of iodine or a twenty-five per cent. solution of resorcin, or of almost any irritant, may be employed for the purpose of producing the desired vascular reaction.

Ultraviolet therapy appears to be especially efficacious. It is a good idea to attend to the patient's general health and to eliminate focal infections and conditions that might irritate the nervous system, such as eyestrain. In generalized cases it is customary to depend upon ultraviolet radiation.

Alopecia seborrhaica.—Dry stage: Prescription VII or VIII should be used daily together with frequent applications of one of the oily suspensions or ointments. If preferred prescription XIII or XIV (lotion containing oil) may be used. Shampoo once weekly with prescription XV, XVI, XVII, or XVIII. Massage is contraindicated. If the case is

very stubborn try prescription IX, X, XI or XII.

Waxy stage.—Daily use of prescription IX, X, XI or XII. In addition, urge the frequent use of the oily suspensions or ointments. Oily suspensions and ointments are more efficacious than are nonoily lotions. Shampoo once weekly with prescription XVI, XVII or XVIII. At times tar soap or prescription XIX seems more efficacious. Massage is contraindicated, at least until all evidence of local disease has disappeared. In stubborn cases sun bathing, ultraviolet light treatment, or high frequency treatment is of value. Painting the scalp with tincture of iodine, or the frequent use of a ten per cent. iodine ointment may be more efficacious than the remedies quoted supra.

Oily stage.—Sulphur and mercury are the principle topical remedies. Prescription IX, X, XI or XII should be vigorously applied daily. In men the oily suspensions II or III, or the ointments V or VI should be used three times weekly. If women refuse to use the oily remedies so often have them apply such remedies the night previous to the shampoo. The shampoo must be very thorough, using prescription XVII, XVIII or XIX. The hair may be washed once weekly, or in case the oil collects rapidly, twice weekly.

These cases are always stubborn. As soon as the scalp appears clean, massage should be instituted. Ultraviolet therapy, sun bathing and high frequency treatment are of value. Sometimes painting the scalp with tincture of iodine or using a ten per cent. iodine ointment proves more efficacious than do mercury or sulphur.

Many women find it inconvenient if not impossible to wash their hair so frequently. In such instances a dry powder dusted into the hair and then brushed out, will reduce the amount of oil (prescription XX).

170 WEST FIFTY-NINTH STREET.

Tooth Infection

By OLIVER T. OSBORNE, M. D.,

New Haven, Conn.

So much has been written concerning this condition, so much that is ultraenthusiastic, and so much that unjustifiably repudiates proved facts, that the really scientific knowledge of the relationship of mouth infection to certain diseases is almost lost in the printed mass.

It is not the object of this article to outline what conditions have been definitely proved to emanate from the infection of the teeth, or to discuss the possibility of other conditions being caused by such infection. My object is to present some common sense thoughts and suggestions concerning the subject of tooth infection.

First, open infection in the mouth should be treated and eradicated.

Second, root infection occurs, and when discovered should be treated and eradicated.

Third, ill fitting crowns and nonremovable bridges are generally odoriferous abominations.

Fourth, the germs that occur in the mouth which are dangerous to carry are the *Streptococcus viridans*, the *Streptococcus hemolyticus*, the *Staphylococcus aureus* (which produces boils), type 1, 2 and 3 of the pneumococcus, the pus forming cocci, diphtheria bacilli, tubercle bacilli, and the spirochetes of syphilis. As the bacteriological and pathological laboratories and the clinical histories show what these germs can do, we must agree that they are a menace to the carrier, and a menace to his closely associated friends and workers. No one wishes deliberately to swallow any substance bathed with any one of these germs, nor wittingly kiss, or allow his children to kiss, a mouth so infected.

What these germs can do to the carrier or to his accidentally inoculated associates need not now be discussed. Also, how much immunity the carriers can develop, and how long such immunity lasts is beside the question. These pathogenic germs are not healthful and do not tend to prolong life, hence they should be eradicated. Also roots infected with these germs must be removed, even if the absorption of toxins only is taking place or is likely to take place.

The only debatable question is, how shall the infection be removed? It would seem that this decision must rest upon, 1, the general health of the patient; 2, the amount of the area of infection and hence the danger of too rapid or careless surgery allowing general infection to occur. This means etherization and radical, complete, surgical removal of all diseased tissues; or a gradual (taking several weeks if thought best) removal of the infected areas under local anesthesia or gas. There is always danger, in gradual procedures and from punctures for local anesthetics, of the fresh wounds allowing absorption of germs from the remaining and as yet unoperated areas of infection. Whatever the procedure, the subsequent local cleanliness (asepsis) must be as nearly perfect as possible.

Whether an infected tooth is worth saving by dental surgery depends upon the health of the rest of the mouth. If there is much pyorrhea in the mouth it is usually unwise to attempt to save such a tooth, as it will generally be a failure. If a gum infection (pyorrhea) has burrowed down much below the surface of the gum toward the root of a tooth, the tooth can rarely be saved; extraction is indicated. Early pyorrhea alveolaris may be so treated as to save the teeth and preserve the health. At the present time too much dabbling prophylactic work is being done. Such temporizing treatment tends to keep the outward and visible sign of pyorrhea invisible while the infection is concealed just below the gums toward the roots of the teeth. More radical and hence more permanent treatment should be the aim of modern dental surgery.

A patient seeking advice from a physician is more or less ill, and if, after an examination, he is found to suffer from a disease that may or may not be caused, and may or may not be aggravated, by coincident tooth infection (and we are agreed that these germs in the mouth are dangerous, at least unhealthy) we should eradicate them, even if they have no bearing on the trouble from which the patient is actually suffering. No one wishes to add a possible new disease to the one that he has. Also it is a fact that a diseased condition renders an immune carrier of mouth germs likely to lose his immunity.

Now comes the crux of the matter, namely, how do we know that there is infection in the mouth?

1. Evident pus needs no elucidation.

2. Many of the germs most dangerous to the body after absorption are some of those above named that do not produce pus. With pus and local pain we are safe, as something will be done for the patient. Without pus and without local pain there is danger, if a pathogenic germ is present.

3. Most animals, and the human animal is no exception, determine the character of their food by the odor, and putrescent food and putrescent drink are abhorrent to the human race. In other words, our sense of smell is largely to protect us from eating foods that are spoiled. Can we then defend putrescence in the mouth? If that putridity is concealed and in a closed pocket, as under crowns and bridges, will any one assert that the absorption of the gases or toxins from these germs or from this putrefaction produces no consequences and is harmless? All dentists know the stench when some of these gold attachments are removed, and if the patient gets a smell of it, his opinion of what he has been harboring is not always printable.

If this putrescence is in a canal of a dead tooth, the danger of the absorption of toxins may not be great, but a neuritis, more or less local, may develop, and the tooth root sooner or later show infection. Unfortunately putridity and some forms of infection cannot be disclosed by x ray films. Also many x ray pictures are imperfect, and many teeth are extracted unnecessarily. Such mistakes can be avoided by the following routine:

First, it should be a dental expert who takes and reads the dental picture.

Second, the dental röntgenologist should consult with the physician who sends the patient for examination, and a consultation decision should be made, much as is done in appendicitis, as to whether or not surgery is necessary.

Third, infection having been thus determined (by several pictures, perhaps by different x ray men) it should be eradicated.

Fourth, if the patient is seriously ill, and only the physician can determine that, temporizing is often dangerous. Radical extraction is often safer.

It is not necessary for the physician and the dentist to agree as to the relation of the mouth infection to the disease. It is the patient's physician who has his life or death or permanent debility at stake, and the dentist can waive all responsibility on that score. Everyone knows of one or more deaths from tooth infection, consequently, one tooth too many removed from a patient's mouth is better than one too few.

The seriousness of carrying disease germs, and especially in the mouth where they are so readily swallowed or absorbed into the lymphatics and the blood, must be recognized by all. Germs as such are not readily absorbed into the blood, but their toxins and ferments are frequently so absorbed and cause symptoms. One of the most frequent and the most serious systemic disturbance caused by mouth infection is disease of the heart. The next most frequent is disturbance of the endocrine glands, and the symptoms from such disturbances are manifold.

A physician is delinquent in his duty to his patient if he does not study the condition of the mouth and throat, and a dentist, who repairs one or more teeth in a patient's mouth and neglects to treat evident infection of other teeth, is delinquent in his duty to the patient.

177 CHURCH STREET.

The Moving Bucky Diaphragm

A Review of the Progress of Clearness in X Ray Pictures

By SINCLAIR TOUSEY, M. D.,
New York.

Twenty-five years' use of the x ray has been required to bring it to a stage where the pictures may be considered really satisfactory. Now for the first time a radiograph presents an accurate chart of the relative density of the part of the body depicted unblurred by rays which take no part in the production of the picture itself.

The x ray image either temporarily visible upon the fluoroscopic screen or permanently recorded upon a photographic film is a shadow showing de-

from the tissues would also reach every part of the shadow.

The first x ray tube upon which a patent was granted consisted of a pearshaped tube in which the cathode particles from the negative terminal, a simple rod inside the tube, impinged upon the glass wall of the tube over most or all of its area. The whole tube became a source of x rays and could not possibly produce a clear image of any object at a distance from the film.

A very great improvement came with the focus

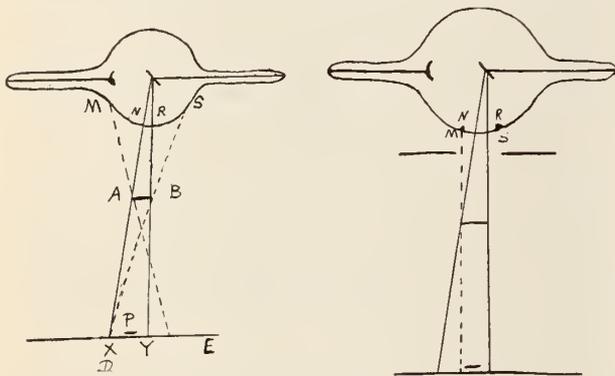


FIG. 1.

FIG. 2.

FIG. 1.—Showing the manner in which a radiograph, reproduced in the first edition of Tousey's book on *Medical Electricity and Röntgen Rays*, published in 1905, was made. Penny near plate shows distinctly in faint shadow of half dollar at a distance.

FIG. 2.—Showing alteration in author's experiment.

tails and contrasts of light and shade. If such an object as a coin is in close contact with the screen or the film its image would be sufficiently sharp to detail and complete as to contrast with the surrounding illuminated area even if the source of x ray were a large one and there were other sources of diffused x rays. But it is entirely different when

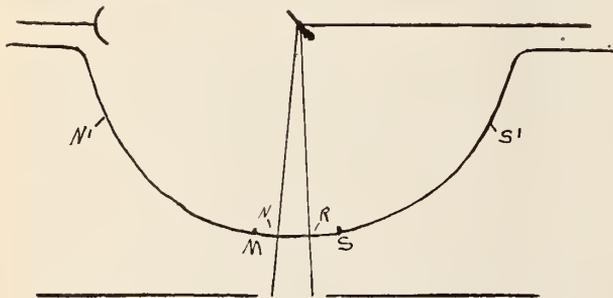


FIG. 3.—Showing areas of secondary radiation.

the object to be depicted, such as a calculus, is at a distance from the film and in the midst of tissues which themselves are a source of secondary x rays. There a large source of primary x rays would in itself produce a vague image which would have only a fraction of its proper density because primary rays from the periphery of the source might reach every part of the shadow, and secondary rays

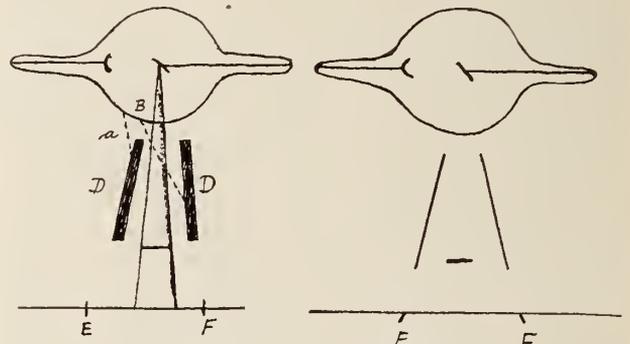


FIG. 4.

FIG. 5.

FIG. 4.—Showing a conical or cylindrical diaphragm.
FIG. 5.—Showing the simplest form of obtaining a picture with a cellular diaphragm.

tube in which the negative terminal was cupshaped, so as to concentrate the cathode particles upon the anticathode in the middle of the tube. The majority of the radiation was from a small focus spot and the pictures became wonderfully clear. But it was soon discovered that there was a disturbing amount of radiation from other parts of the tube. In fact, the entire illuminated hemisphere of the gas filled tube, then in use, was an active source of secondary x rays. A radiograph reproduced in the first edition of my book on *Medical Electricity and Röntgen Rays* (1) was made in the manner shown in Fig. 1. A. B. was a silver half dollar, an object entirely opaque to the amount of x ray employed. This was placed midway between the anticathode and the photographic plate. P was a cent placed in the shadow X Y of the half dollar. The result was a very faint shadow of the half dollar and a complete and distinct shadow of the cent. Rays from the part of the tube between M and N illuminated the whole plate from its left limit to E. This illuminated area included the entire shadow of the half dollar at the level of the plate. And that

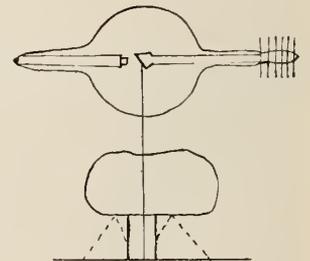


FIG. 8.—Diagram showing the Bucky diaphragm.

the object to be depicted, such as a calculus, is at a distance from the film and in the midst of tissues which themselves are a source of secondary x rays. There a large source of primary x rays would in itself produce a vague image which would have only a fraction of its proper density because primary rays from the periphery of the source might reach every part of the shadow, and secondary rays

shadow was further illuminated by rays from R S which reach the plate from its right extremity to D.

It was soon noticed by all radiographers that a small diaphragm, or opening, in an obstacle opaque

came so complete that the cent was no longer visible in it. Even then some secondary rays from the part of the tube between M and N encroached upon the shadow of the half dollar but not in sufficient quantity to mar the effect of the direct rays. In Fig. 3 the area from which secondary rays may reach the shadow of the half dollar is indicated by the diameter N' to S' and the greatly reduced area of secondary radiation acting through a small diaphragm is shown by the diameter M to S. The effect is even greater than apparent in the drawing because, of course, the area producing secondary radiation varies as the square of its diameter. A small diaphragm made it possible for the first time to make useful anteroposterior radiographs of the head showing the pneumatic sinuses. And in this case it was not open to any serious objection. Al-

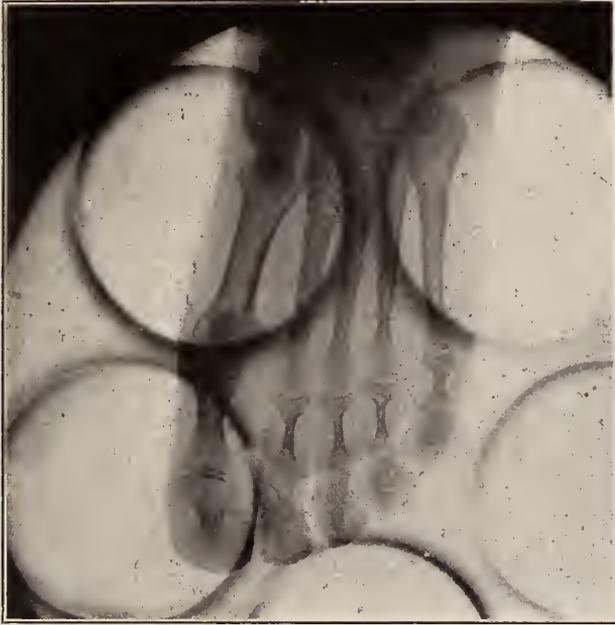


FIG. 6.—Radiograph made with Tousey's (multiple trumpet) radiating cellular diaphragm, January 8, 1908 (pat. ent. of Dr. George A. Dixon). Showed that no portion of a needle remained in the foot.

to the x ray and close to the x ray tube improved to a very great degree pictures of any object at a distance from the plate and especially through the



FIG. 9.—Radiograph of abdomen, lumbar and dorsal regions, for the detection of urinary or biliary calculi. Moving Bucky diaphragm used.

head or any thick part of the body. To show the cause of this the author's experiment was altered as in Fig. 2. The shadow of the half dollar be-



FIG. 7.—Radiograph made with Tousey's (multiple trumpet) radiating cellular diaphragm, January 11, 1908. Patient of Dr. Joseph Abraham. Shows probe entering frontal sinus.

bers-Schönberg suggested the employment of a conical or cylindrical diaphragm, basing its claim to advantage on Fig. 4, in which D is a conical or cylindrical diaphragm. Certain rays like A which would have blurred the image of the foreign body are arrested by the cone, but they would have just as well have been stopped by a flat diaphragm with the same sized orifice. Certain other rays like B are arrested, but they would have been entirely outside the picture, which extends only from E to F whether a cone or a flat diaphragm were used. But searching for such objects as a renal, ureteral or biliary calculus the small size that the clearest picture could have was a great drawback.

TOUSEY'S RADIATING CELLULAR DIAPHRAGM.

This was first published in the 1905 edition of my book, perfectly legal proof of priority of dis-

covery having been previously secured. It consisted in placing one or more cells with thin walls radiating so that the walls should cast only linear shadows from the direct focus rays while obstructing most of the secondary rays. The object was to obtain a picture say 14 by 17 inches with as clear definition as one only six inches in diameter made with a small diaphragm. Fig. 5 shows the simplest form consisting of a single thin walled cone so placed that its walls coincide with direct rays and therefore cast a shadow which is simply a circular line. The picture from E to F is the same as if any other flat or conical diaphragm were used as in Fig. 2. But in addition the portions of the plate beyond are used. This would not be the case with a flat diaphragm because the corresponding rays are all cut off. Neither would it be the case with a cylindrical diaphragm whose walls would intercept most of such rays. A cone would only accomplish the purpose if its walls were very thin and radiated exactly from the focus spot as in my invention.

A question may arise as to the quality of the radiation outside the cone. This is improved by the presence of the cone. While secondary rays can reach the plate from the part of the x ray tube outside the cone on the same side, those from inside the cone or on the side of the tube beyond the cone would be arrested by the latter. In a more complex form it consisted of a number of trumpetshaped cells all radiating from the focus spot of the anticathode although entirely outside the x ray tube. Figs. 6 and 7 are radiographs made with such a radiating cellular diaphragm.

Tousey's radiating cellular diaphragm accomplished the object of improving the radiation from a gas filled x ray tube by suppressing the greater part of the secondary radiation without reducing the size of the picture. My invention of a gas filled x ray tube with an aluminum cylinder surrounding the anticathode obviated secondary radiation from the glass wall of the tube. The Coolidge x ray tube also produces no secondary radiation from the glass wall of the tube. But either a gas filled tube with Tousey's radiating cellular diaphragm, or his tube with an internal filter, or the Coolidge tube while applying the proper radiation to the patient fails to suppress secondary rays arising in the tissues. And with either of these a diaphragm with a small orifice, making only a small picture, was required for the greatest clearness.

FILTERS BETWEEN THE PATIENT AND THE PLATE.

The secondary rays from the tissues are usually of a lower degree of penetration than the direct focus rays. And a sheet of aluminum one fifth inch thick, or of roofer's tin, one, two, or three thicknesses according to the degree of penetration employed, will usually arrest more of the secondary rays than of the direct ones. The result is usually a picture with greater contrast than is obtainable over a fourteen by seventeen inch film without a filter, but not as good a picture as a small one made with a small diaphragm.

THE BUCKY DIAPHRAGM.

This was the next forward step. Bucky called attention to the fact that a hollow cylinder of opaque

material between the patient and the screen or plate greatly improved the image. And in a radiograph through the abdomen I found that within the area of a cylinder three times as long as its diameter the effect upon the plate was only half that produced elsewhere. The diagram in Fig. 8 shows that none of the direct rays were obstructed, so that in this experiment half the general effect upon the plate was by secondary rays. The darkening of the film by the latter did not strengthen the image but only blurred it except inside the cylinder. Bucky's patent covers a flat screen made up of many cells open at both ends, having their walls all radiating from the anticathode like mine but intended to be placed between the patient and the plate. This gave wonderful pictures over a 14 by 17 inch plate, but they were marred by the image of the numerous partitions and to move this diaphragm in such a way as to do away with its shadows was almost impossible. For some years therefore the Bucky diaphragm was only a theory, but within the last few months it has become a practical success and a necessity.

THE MOVING BUCKY DIAPHRAGM.

The cross partitions have been left out. The screen has the effect of a number of slits instead of a number of open ended cells. The grid is made in a curved form like part of a barrel, or more exactly, of a hollow cylinder. The tube is placed anywhere directly over the middle line of the grid at its axis of curvature, say twenty-five inches, not necessarily directly over the centre as with a cellular screen. The screen is given a pendulum motion from side to side so that the slits always face the x ray tube. The grid is made of lead strips between and held in position by wooden strips transparent to the x ray. The patient rests upon a stationary transparent support above the moving grid and the plate is stationary below the grid. Of course it is at once manifest that the partitions arrest secondary rays coming from either side and a moment's thought will show that with narrow deep slots the only secondary rays not arrested will be those that are almost exactly parallel with the partitions. In practice it is estimated that nine tenths of the secondary radiation is arrested. With this screen one needs no other diaphragm or filter and all parts of a 14 by 17 plate show wonderful contrast and definition. A man who develops many radiographs describes the pictures as being as good radiographs of the bones as if they were of a skeleton. But in addition one secures a perfect picture of the flesh and any foreign body.

The technic of exposure including voltage, spark length, milliamperage, and time for various parts of the body, and details as to development will doubtless be made the subject of special articles by other writers and are also described in the third edition of my book (1).

It has always been possible with hard x rays and a long exposure to produce sufficient density of the plate even through the thickest parts of the largest person. But the result could scarcely be dignified by the name of picture. It was so devoid of contrast that scarcely could the vertebrae be made out,

and it was usually a matter of guesswork whether a gallstone was present or not. It is in such cases that the most wonderful advantage is secured, but the apparatus also facilitates and improves radiography of the head and of every part of the trunk. It is not required for the hand or the toes and metatarsus but elsewhere in the extremities it is advantageous.

Fig. 9 is a moving Bucky diaphragm radiograph of a patient weighing one hundred and twenty-three pounds, referred by Dr. Peter Irving, which showed no renal or biliary calculi.

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The Elimination of Secondary Radiation in Radiography

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It has been well said that the moving Bucky diaphragm is the greatest advance in röntgenology since the perfection of the Coolidge tube. In the early stages of the practice, when the use of plates and coils was in vogue, good bone detail was a rarity, gastrointestinal work could not be attempted because the unit of time was a factor. With the advent of high tension transformers, x ray plate and single intensifying screen, we began to see light and perfect technic for this kind of work. High milliamperage and fractional second exposures seemed to answer the purpose. With duplitized films and double intensifying screens, we were certain that we had arrived at perfect radiography. It was most natural that each operator should work out the technic which for him produced the best results; but there was really no definite standardized schedule of technic.

The innovation of the several types of Coolidge tubes was really the first step in the advancement of a definite universal standard technic; for with its easy means of vacuum regulation we were able to duplicate exposures at will. In parts that required long exposure, such as kidney, gallbladder, sacral and lumbar spine, we have always been confronted with the apparent fogging of the plates or films, no matter what kind of technic we used; this was especially the case with the hard technic. The very fine detail we were in search of in deep parts was invariably overshadowed by the fogging due to secondary radiation set up in the tissues themselves.

The elimination of this secondary radiation was of vital importance for correct interpretation of radiographic findings.

The original ideas of a filter or diaphragm as set forth by Dr. Hollis Potter, of Chicago, were put into practical application, resulting in the present Bucky-Potter diaphragm. By means of this instrument the secondary radiation caused by the passing of the direct ray through the body is eliminated, thus removing the hazy appearance always found in radiographs of the deeper parts of the body. The resulting radiographs are extremely clear, showing detail in bone structure in a way heretofore not possible to obtain.

ADVANTAGES.

1. Gallstones, not easily shown by the old method, can be readily detected.
2. The entire urinary tract is shown with surprising clearness on a single fourteen inch by seventeen inch duplitized film.
3. The diagnosis of luxation of the sacroiliac joints, lateral views of the spine and pro-lapsed kidney can readily be made.

Several hundred radiograms taken through this filter show that the heavier the patient the clearer the detail.

REQUISITES.

1. The radiator type of Coolidge tube should be centred over the diaphragm at twenty-five inches plate distance for anterior posterior views; for lateral views the distance over the diaphragm should be thirty inches.



FIG. 1.—Lateral x ray view showing bone structure with a clarity not obtained by older methods.

2. Duplitzed films with double intensifying screens are used exclusively.

3. Rubber bladder compression for all cases.

TECHNIC.

1. The grid of the diaphragm must be in motion during the entire exposure and requires an additional three seconds before starting and after stopping the x ray exposure.

2. The very soft technic has shown best results, i. e., ten milliamperes of current with longer time

as a unit, and using ten milliamperes of current, five inch spark gap, one hundred and ten volts of current, the following exposure seconds has proved very satisfactory:

Shoulder, knee	4 seconds
Pelvis, sacroiliacs	15 seconds
Skull, sinuses	15 seconds
Gallbladder	8 to 10 seconds
Renals	12 to 15 seconds
Vertebrae (anterior view).....	15 seconds
Vertebrae (lateral view).....	20 seconds

The technic outlined above, if worked out prop-



FIG. 2.—Anteroposterior x ray taken by the new method of elimination of secondary rays.

exposure. A longer spark gap (from one to two inches) is used in this technic than is used without the diaphragm.

3. Taking the one hundred and fifty pound patient



FIG. 3.—Pelvic region x ray plate taken by the new method of eliminating secondary rays.

erly, will produce a beautiful black and white radiogram with perfect detail that was heretofore impossible to obtain.

1008 ST. JOHNS PLACE.

Röntgen Ray Therapy in Chronic Diseases of the Bones, Joints and Tendons*

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"A useful field and an ever increasing one exists in the treatment of chronic septic wounds, where the judicious employment of radiation treatment, in one or other of its forms, will lead to the attainment of satisfactory results, which may be far in advance of any obtainable by the better known and more widely used methods of the day" (1).

Probably the cause of many failures in the past, and one of the reasons for x ray therapy not being used more generally and extensively by this time, is the fact that the doses were too intensive and de-

structive, the operator repeating, possibly automatically, the dose used in malignant conditions. This was recognized early in our work as a serious handicap, for good results can be accomplished only by the proper employment of a technic which will stimulate vital metabolic processes and not impede and destroy them. This thought is echoed in a recent article by Peterson and Saehof (2), who in very definite terms extol the stimulating powers of the x ray, and decry the lack of progress in the field of therapy as compared with x ray examination and diagnosis.

For the past two years, at the Hospital for Joint Diseases, x ray therapy has been consistently used

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in the treatment of various orthopedic conditions, particularly chronic bone and joint diseases. The problem at first consisted of working out a satisfactory technic. The object desired was the production of an effective stimulation of cellular metabolism in the diseased zone, and all degrees of suberythema doses were administered crossfire to produce the desired effect in the lesion. Sufficient experimental and actual clinical experiences had been recorded to give us no qualms of conscience as to the rationale of the therapy, and as far as its safety was concerned no harmful effects were anticipated and none were encountered.

Fifty patients have been radiated, the plan of treatment consisting of rounds of exposures repeated monthly. Some patients have been treated for four consecutive months, the duration and intensity of the treatment being determined by the condition of the patient and the response to treatment. Forty per cent. of the patients have been observed for one year or more after the cessation of the treatments, and sixty per cent. for more than six months. Before giving a résumé of the results, it must be stated that failures were encountered. In three cases no effects at all were observed. In eight cases improvement was instantaneous and very gratifying but relapses set in after a few months, and the conditions reverted to nearly their former state. In some cases we were inclined to attribute the failures or relapses to the basic pathological conditions being too formidable to be cured by stimulation exclusively, e. g., cases in which operations and the radical removal of extensive diseased tissues were required. In the other cases, these relapses are attributable to improper hygienic and industrial conditions, and in two in particular, to unremediable neglected orthopedic measures. Then again it must be remembered that faulty technic may account for some of the failures to get permanent improvement, this method of treatment being after all still in the experimental stage. Time, further experience, and final standardization of the therapy of these conditions will ultimately secure more uniform results. A careful analysis of the records of the treated cases shows that, notwithstanding the fact that the results are not uniform in all cases, they are infinitely better than can possibly be secured by any other known form of therapy. The effects of the therapy are best described individually, in each class of cases treated.

TUBERCULOUS ARTHRITIS AND OSTEOMYELITIS.

There is marked improvement after the first few radiations. Pain and muscle spasm disappear almost at once, a feeling of improvement and well being replace malaise and discouragement, and the night cries will disappear. The character of the discharge from the sinuses changes. At first it may be increased, but for a few days only, when it changes to a serous type and gradually diminishes in amount, frequently drying up permanently. Some of the patients started to gain weight and color immediately after the onset of the treatments.

CHRONIC OSTEOMYELITIS (PYOGENIC).

As a distinct aid in hastening sequestration and the passage of the sequestrum, if it should be small

in size, this method of therapy is incomparable. It is surprising indeed to note how frequently a sequestrum will be exfoliated and passed following merely a few radiations of the affected region. The effect on chronic sinuses is somewhat similar to tuberculous sinuses. At first, the discharge is increased and considerable detritus and slough may come away, after which the amount is distinctly decreased. In many cases the sinus closed up entirely and permanently. In some cases, after a few exposures had been administered, the radiation produced a distinctly bloody character to the discharge, which change may justly be considered a direct result of a pronounced hyperemia and increased cellular metabolism. The effect of the therapy is gratifying in cases of acute exacerbations of chronic osteomyelitis, where a deep seated abscess exists close to the bone, and a few radiations will make it point and even rupture through the skin, with a considerable saving of time to the patient.

CHRONIC ARTHRITIS.

Distinct analgesic results have been recorded in painful arthritides. No actual changes in the joints, as determined by physical and x ray examinations, can be made out, but the subjective improvement was almost instantaneous. Relief from pain was secured in cases where the usual drug, physical, and other electrical methods of treatment failed completely.

GANGLIA CHRONIC TENOSYNOVITIS.

The first ganglion treated was almost accidental. A physician on the staff of the hospital had been operated upon three times for a recurrent ganglion of the wrist, and the end result was a chronic sinus, through which the frequently accumulated ganglion contents was as frequently expressed. It was radiated at first with a mild stimulating dose, only temporary improvement resulting. More intensive crossfire radiation was then used, resulting in a permanent closure of the sinus and a complete disappearance of the ganglion. Several untreated cases of ganglia of varying size, one extensive with rice bodies and considered tuberculous, have since been treated with uniform results. The degenerative processes become permanently inhibited, and the tumors gradually disappear, apparently never to return. This has been extended to the treatment of chronic bursitis, with one encouraging result recorded. Further work in this particular field will be carried out.

A few case histories are herewith submitted, to supplement this brief report, to show how immediate and gratifying the results of röntgen ray therapy are when properly administered:

CASE I.—H. W., male, six years old, referred by Dr. Finkelstein. The father of the patient had a healed tuberculous hip. About three years ago, the patient began to complain of pains in the left knee. He did not limp immediately, but there was considerable difficulty in climbing stairs. The condition progressed gradually, medical advice was sought, and he was referred to an orthopedic institute, where a diagnosis of hip-disease was made after x ray and physical examinations. A plaster spica was applied, but the pain was unrelieved and the patient, when

referred to Dr. Finkelstein, was in agony. He limped considerably, the knee was very tender, he had marked spasm, spent most of his time in bed and frequently had night cries. His general condition was very poor, he was pale and emaciated and extremely irritable. A traction hip splint was ad-



FIG. 1.—Tuberculous ganglion before treatment.

vised which the patient wore for over a year, but although there was slight amelioration of the pain, he was never free from symptoms. The patient was then referred for x ray therapy. When the brace was removed for the first exposure, he screamed in agony. He was given half an erythema dose of deep therapy, filtered with four mm. aluminum, anteriorly over the hip joint. Two days later the left side of the hip was exposed similarly focussing over the hip joint. This was followed two days later by a similar exposure from the posterior aspect. At the end of the first treatment, moderate improvement was noted; at the end of the first week, to quote the mother's statement, "he was an entirely different boy." Temperature, night cries, pain and discomfort had all disappeared. The brace could be removed without the slightest pain or apprehension. This particular change was more than noticeable in the x ray room when the patient was being prepared for the treatments, for previously he had screamed in an unearthly manner when the brace was removed. After the second round of treatments, started the fifth week after the beginning of the radiations, the patient was completely free from pain, malaise and fever, was gaining weight and making wonderful progress towards recovery. He was given a third round of exposures. He has since moved to Philadelphia, but occasional letters from his mother state he has had no trouble whatsoever since the treatments, which were given more than a year ago.

CASE II.—M. M., male, aged sixteen years. The patient suffered from Pott's disease of the dorsal spine of nine years' duration, with extensive caries of the vertebræ and resulting marked kyphotic deformity. When presenting himself for treatment, severe pain was present in the back and sides, accompanied by profound weakness, the latter preventing walking, going up stairs, or exertion of any degree. His general condition was none too good, he was anemic, poorly nourished, and distinctly losing ground. After a few crossfire radiations, the

pain disappeared, he improved generally and rapidly, and very soon could walk half a mile with ease. He also started to gain in weight and color, and to improve generally. After the second round of treatments a slight cough with slight elevation of temperature developed. These symptoms, however, were of short duration, resembling very closely a systemic tuberculin reaction, and made us cautious about submitting the patient to subsequent radiations. They were continued after an interval of two months with diminished intensity, resulting in a much improved condition, which has been permanent for over a year. The pain, weakness and dyspnea have never returned.

CASE III.—D. S., male, aged twenty-one years. The patient suffered from an old tuberculous arthritis of the elbow joint with ankylosis and a chronic sinus requiring daily change of dressings for one year prior to the beginning of the x ray treatment. Considerable pain was present, necessitating the support of the arm in a brace, the arm being practically useless. He was radiated twice a month, once on the flexor side of the elbow and then over the extensor surface. The sinus closed after the second exposure, the second week after the treatments were started. The pain disappeared at the same time and has never returned. The patient was radiated the same way the following month, after which the brace was discarded and the patient encouraged to use his arm. An occasional drop appeared at the sinus orifice, which, however, soon closed permanently. The treatments were continued for six months. It is now over a year since the last treatment, and there has been no drainage for fourteen months and no return of the pain or discomfort, the patient using his arm freely without support, and but for the ankylosis would be unaware of his disability.

CASE IV.—J. B., male, aged forty-five years. In February, 1920, the patient suffered a comminuted fracture of the right elbow for which he was treated



FIG. 2.—Tuberculous ganglion after treatment. Same patient as in Fig. 1.

in the Harlem Hospital. Although the injury was not compound, infection set in and a chronic osteomyelitis developed, for which he was operated upon four times within six months. When he first appeared in the x ray department, he required daily

dressings for drainage from three sinuses. At the time of the first radiation, on October 7, 1920, there was at least half a dram of pus discharging daily from each of the three sinuses. The elbow was extremely painful, necessitating the use of a plaster support for the elbow joint, thus relieving the pain somewhat. At the end of the first round of treatments the discharge diminished to one or two drops daily. Two sinuses closed a few days later but the third continued to discharge one or two drops daily, for another month until after the next radiation, when it too closed completely. The pain in the elbow joint disappeared and the cast was discarded at this time. A third round of exposures were administered. Three months have passed since the last exposure and there has been no return of the discharge. The elbow joint is ankylosed but the arm is used freely.

CASE V.—T. W., male, aged thirty-four years. This patient was referred to the x ray department with a large, elongated ganglion on the extensor surface of the right hand. Some rice bodies were present. The condition was considered tuberculous. Radiation was carried out with slight stimulating doses, directly over and then crossfire from the flexor side. The tumor became perceptibly smaller, but showed no tendency to disappear. The technic was then changed to a more intensive stimulation with an almost immediate response and disappearance of the tumor except for a small hard mass which was continually shrinking in size. This was undoubtedly scar tissue surrounding the rice bodies. An ultimate complete disappearance of the small fibrotic residue is anticipated, as has been secured in the treatment of simple ganglia which have disappeared completely after two rounds of radiation. (Figs. 1 and 2.)

SUMMARY.

1. Röntgenotherapy is available as probably the greatest but least used therapeutic agent in the orthopedists' armamentarium.

2. Night cries, muscle spasm, uncontrollable pain, temperature, and malaise frequently disappear after a few radiations.

3. Sequestration is favored by x ray radiation. The chronicity of osteomyelitis is markedly shortened. Drainage by radiation from deep seated abscesses is favored.

4. Chronic sinuses dry up and become obliterated.

5. The degenerative processes in ganglia are checked by radiation with resulting disappearance of the ganglia. Chronic tenosynovitis is similarly affected.

6. Orthopedic and surgical measures are aided and not replaced by x ray therapy. Braces, casts and the like should not be discontinued during the treatments, until definite cures have been established.

7. A strong plea is herewith registered by us for a greater adaptation in a clinical way of röntgen therapy. Technic is now established on an absolutely safe basis and careful observation of the patient with intelligent administration of stimulating doses can do no harm, but on the contrary can save considerable time to the patient, as well as at times life and limb. It is not difficult for us to anticipate in the very near future x ray therapy departments in large orthopedic clinics. They will be considered as essential as the diagnostic x ray laboratories in the same institution, or as necessary as they are considered at the present time in the large dermatological and gynecological clinics of the country.

Sincere appreciation is herewith expressed to Dr. H. W. Frauenthal for his helpful encouragement and the free use of material from his service in the Hospital for Joint Diseases.

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The Operation for Femoral Hernia with a Suprapubic Incision*

A Modification of the Operation of Ruggi

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The sac of femoral hernia can be divided into three distinct portions: the infundibulum, the neck of the sac, and the fundus. The infundibulum is intraabdominal and occupies the space between the peritoneum and the femoral orifice; the neck corresponds to the femoral orifice; and the fundus or sac proper, occupies the triangle of Scarpa and in large hernias is almost subcutaneous.

In other words, the abdominal walls divide the femoral sac into two sections—one internal (or intraabdominal), and the other external or extraabdominal, and the intraabdominal part of the sac, the

infundibulum, cannot be reached through a femoral incision which allows us only to work on the external surface of the femoral ring and of the abdominal walls.

STAGES OF OPERATION.

The operation of femoral hernia consists of four different stages: 1. Isolation and incision of the sac. 2. Inspection, reduction or resection of the contents of the sac according to special conditions and circumstances. 3. Ligation or suture of the empty sac and its excision. 4. Closure of the musculoaponeurotic opening of hernia.

If we analyze these different steps we find that the object of the first and second steps is to repair

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the imminent danger of the presence of hernia, and the scope of the third and fourth steps is the prevention of future recurrence. There is no question as to the absolute importance of the first two steps of the operation. The sac must always be well opened and the contents of same attended to; but if we give our attention to the relative value attached to the remaining two steps we find that there is, among surgeons, a difference of opinion as to which of the two is the most important to prevent recurrence.

Many surgeons seem to think that a radical cure of femoral hernia is more assured by a complete closure of the femoral ring and canal, while others are of the opinion that a complete excision of the sac and its infundibulum is a better protection against recurrence than the closure of the femoral ring; but as we have seen that the only way to reach the infundibulum is to perform the operation in the internal or abdominal surface of the abdominal wall, we can group all the different methods advocated for femoral hernia into two classes, the essential difference between the two classes being whether the operation is extraabdominal and performed on the external surface of the femoral ring, or whether it is intraabdominal and performed on the internal surface of the femoral ring. To the first group belong all operations done through the femoral route, and to the second group the operation of Ruggi.

Any operation done extraabdominally with the femoral incision is not generally satisfactory; the femoral sac ordinarily is small, the walls of the sac are thickened, and these two circumstances render it very difficult to open the sac. It is also difficult to reduce the contents of the sac, which cannot be completely excised with certainty. The closure of the femoral ring and the femoral canal is not easy, and not one of the numerous methods described by many authors is satisfactory or generally accepted. Other dangers arise from the vicinity of the femoral vessels and from the frequent anomaly of the obturator artery.

OPERATION OF RUGGI.

It was to obviate all these inconveniences that Ruggi of Bologna, in the year 1893, advised the inguinal method as the method of choice for femoral hernia. The originality and the ingenuity of the operation of Ruggi consist mainly in the fact that he was the first to recognize the necessity to operate intraabdominally or on the internal surface of the femoral ring and he was so convinced of this necessity that he thought it of little consequence to incise through the inguinal canal to reach the hernial sac. Perhaps the sacrifice of the inguinal canal was the reason that his operation was not sooner accepted by the great majority of surgeons, although it is by far more rational, more anatomically correct, and the most secure of all the operations for femoral hernia.

Before Ruggi, Annandale, in 1876, in an operation, used an inguinal incision upon a femoral hernia on a patient affected with both inguinal and femoral hernia on the same side, but he did not advocate the inguinal method as the best method for femoral hernia.

Ruggi has given such a complete and detailed de-

scription of his operation, specifying all the minute particulars with such clearness, that in my opinion the original communication gives the best idea of the inguinal operation. It is very interesting to compare his description with the account of the same operation found in many recent textbooks and medical periodicals. I have noticed that in this country other surgeons have been given credit as originators of his operation, and I feel that it is my duty, not only as an Italian, but also for the sake of truth, to give to one of the greatest living Italian surgeons the honor that is due him. To this end I will add as an appendix a literal translation of the description that Giuseppe Ruggi has given of his operation. This description I take from the treatise on operative surgery by my beloved teacher, Professor Francesco Occhini, of Rome.

Ruggi has described two methods for his operation. One way is to dissect and open the hernial sac before opening the inguinal canal. In the second way the inguinal canal is opened first as for operation on inguinal hernia, the cord is displaced, the fascia transversalis incised, and the internal surface of the femoral ring exposed. The sac is then extracted from the femoral canal and opened. After the reduction of its contents, the sac is ligated or sutured at the level of the peritoneum and excised. A few stitches unite the Poupart and Cooper ligaments and finally the inguinal canal is closed as in Bassini's operation.

In this operation it is not only possible to open the sac with great facility, but the closure of the femoral ring is done with greater security, as Cooper's ligament is better exposed in this than the femoral operation. It has been said that the inguinal operation has few followers but that these few are all convinced and enthusiastic. I will say that the femoral operation has many followers but none of them are satisfied. I feel that, in femoral hernia as well as in many other things in life, that it is much better to be in a small company and feel right than it is to follow the crowd and be in error.

The greatest objection to the inguinal method is that it requires incision of the inguinal canal which may leave a predisposition to inguinal hernia. I thought that it was possible to reach the internal surface of the femoral ring with a suprapubic incision leaving the inguinal canal untouched. In my method I open the abdomen in the midline above the pubis with a vertical incision. The two recti muscles are separated and the rectus of the side of the hernia is retracted with a strong retractor. The peritoneum is separated from the abdominal walls and the femoral ring is exposed. This exposure is easy because the ring is very near to the insertion of the rectus. The sac is separated from the femoral ring with blunt dissection and is pulled out intact from the femoral canal with the aid of a small spongeholder.

This part of the operation requires some patience and it may be necessary to make an incision on the Gimbernat ligament to extract a large sac. But when the sac is extracted from the femoral canal all the remaining steps of the operation are made with great facility. The sac has now the appearance of a diverticulum of the peritoneum and can be

easily opened and when empty of its contents can be ligated and excised at the level of the peritoneum. Two or three stitches will now bring the Poupart ligament nearer to the Cooper ligament to reduce the diameters of the orifice. This method should not be confounded with the methods of Lawson Tait and Widenhauer Monnsell. These authors advise operation of femoral hernia from the peritoneal cavity. In the suprapubic method the operation is extra-peritoneal.

In this modification the operation is practically identical with the operation of Ruggi, the only difference being that the inguinal canal is not opened. I first used this method in 1915 upon a woman affected with double femoral hernia, when I tried to do both operations with a single incision. With this method I also operated upon a man affected with double femoral hernia and chronic appendicitis, and the three operations were performed with one incision only. This same method was used by me in operating upon two men upon whom I had operated years before with the ordinary method for femoral hernia and in both there had been a recurrence. These operations done with the suprapubic incision were successful and up to the present time there has been no recurrence.

CONCLUSION.

In conclusion, I will say that it is possible to reach the internal surface of the femoral orifice with a vertical suprapubic incision separating the two recti muscles of the abdomen; and that with the suprapubic incision we can obtain all the advantages of Ruggi's operation without incurring any of the possible inconveniences resulting from the incision of the normal inguinal canal.

APPENDIX.

Two methods to operate upon femoral hernia with the inguinal incision as described by Professor Giuseppe Ruggi, of Bologna, Italy, in 1893.

FIRST METHOD.

The incision of the skin is made over and parallel to the Poupart ligament. This incision should begin at the spine of the pubis and extend to slightly beyond a point midway between the anterior iliac spine and pubis. The skin, subcutaneous tissue and superficial fascia are thus divided. By retracting the margins of this wound it is easy to expose the hernial sac and all the fovea. The sac thus exposed is isolated and opened and the contents of the sac reduced. In order to reduce the viscera it is sometimes necessary to incise the neck of the sac, the femoral ring and Gimbernat's ligament.

Having thus reduced the viscera, I excise that part of the sac which for its volume may render difficult the following steps of the operation. If I find that the omentum is adherent to the walls of the sac, I ligate it and excise it together with the sac. I have in this way completed the first stage of the operation.

The second stage of the operation consists in opening the inguinal canal with an incision on the aponeurosis of the external oblique muscle one quarter of an inch above the Poupart ligament. The

centre of this incision must correspond to the level of the femoral ring.

I displace and retract upward the organs contained in the inguinal canal together with the muscles of the internal oblique and transversalis and so I expose the floor of the inguinal canal whose posterior wall is formed by the fascia transversalis. This fascia can easily be detached with the index finger, but if I find it unusually resistant I cut it through with a knife and detach it from the Poupart ligament and thus I expose the peritoneal cellular tissue.

Having thus completed the second stage which consists in the displacement and definite disposal of the hernial sac, I catch the sac with a pair of blunt and strong forceps and push it through the inguinal wound. This change of position of the sac is easily accomplished as there is nothing that now keeps the neck of the sac adherent to the femoral ring. This displacement is favorable to the radical cure of hernia as it serves to tear away the adhesions of the sac to the femoral ring and canal and permits one to remove entirely the infundibulum. Besides, the sac brought from above Poupart's ligament can be widely opened and its internal cavity well inspected. This inspection was impossible as long as the sac was confined in the narrow space of the femoral canal. This done, I make a ligature *en masse* of the sac, taking care to place a few stitches to prevent the ligature from slipping away, sometimes using a pursestring suture on the internal part of the sac, and in this way making more certain that the peritoneum is well closed. I generally reinforce the pursestring suture with an external suture.

I think that the complete closure of the sac destroying every trace of the infundibulum represents a real progress in technic, and this closure has the same value of the closure of the internal orifice of the femoral ring which I am now going to describe as the fourth stage of the operation. I close the internal orifice of the femoral canal, suturing together the Cooper and Poupart ligaments with a double suture.

First, internal suture.—I use for this suture small curved needles not too sharp, threaded with strong catgut. The assistant with retractors keeps the wound wide open and I put the point of my left index finger into the wound in such a way as to protect the iliac vein and I try to push this vein toward the external side. I place the first stitch externally as near as I can to the vein. The needle must pass first through the Cooper ligament and then through Poupart's ligament. Generally I put three stitches and the last stitch takes in the Gimbernat ligament which is only a derivation of Poupart.

Second, external suture.—I use for this suture the same strong catgut, only I pass the needle through Poupart's ligament first, then through Cooper's and then again through Poupart's ligament to knot the stitch. In this way the knots of the suture are brought in front of Poupart's ligament and externally, while in the first suture the knots remain in the inside. For this second suture, I make use of needles not so curved and a little longer. When for special anatomical conditions I cannot bring together the Cooper and Poupart ligaments, I

use a modification consisting of making a small flap out of the Cooper ligament and using this flap to close the crural orifice. To obtain this flap, I protect the iliac vein with my left index finger and with the right hand I make two incisions on the pubis with a small knife, one horizontal and the other anteroposterior. With the horizontal incision I detach the Cooper ligament from the ileopectineal aponeurosis and with the anteroposterior incision I complete the formation of a little flap, and then suture this flap to the inferior margin of Poupart's ligament.

In the fifth stage of the operation all parts must be sutured with adapted sutures. It is necessary to suture the walls of the inguinal canal and all the layers and finally the skin.

SECOND METHOD.

The same incision is made as in the preceding method. The skin, subcutaneous tissue and fascia superficialis are incised and the aponeurosis of the external oblique muscle exposed. This done, I open the inguinal canal, cutting through the aponeurosis of the external oblique muscle, the round ligament in the female, the cord in the male is displaced upwards, and the posterior wall of the inguinal canal, the fascia transversalis, is incised. I then look for the sac which naturally in typical herniæ is in the internal side of the vein, and with a pair of forceps I pull it out of the femoral canal. All the other stages of the operation are identical with the same stages of the first method.

43 WEST ELEVENTH STREET.

The Biology of Bone Development in Its Relation to Bone Transplantation*

By PHILIP WILLIAM NATHAN, M. D.,

New York.

This paper was read as a part of a symposium at a meeting of the orthopedic section of the New York Academy of Medicine. It is like all communications upon which a time limit is set, somewhat in the nature of an abstract; and under ordinary circumstances I would not consider its publication as an original communication desirable. But as the literature on bone transplantation is so very extensive and for this reason, so confusing, it occurred to me that in this instance an abstract might serve a useful purpose. Therefore, although it has the shortcomings of all such papers besides some of its own, it is here presented.

The skeleton is derived from the sclerotome which originates from the mesoderm. Whether the true bone tissue is thus derived is, however, not absolutely certain; for in the lower vertebrates the dermal skeleton, which is analogous to the bony skeleton of vertebrates generally, is derived from the ectoderm and the parts of the teeth that are composed of true bone are derived from the ectoderm even in man.

The skeleton is, as you know, first laid down in cartilage; and the various elements that compose it are fairly complete models of the form and construction of the skeleton before there are signs of ossification. At a definite time and in a definite location, differing according to the skeletal element, ossification is ushered in by vascular invasion. At this time the cartilaginous element is composed of a hyaline core surrounded by a layer of procartilage cells over which there is a layer of connective tissue cells generally described as the perichondrium. A bloodvessel pierces the perichondrium, sends branches in all directions on the surface of the cartilage and at the same time invades the central

core. Thus the primordial medullary cavity is begun and the so-called periosteal ossification is inaugurated.

It is certain that the ossification does not begin until certain cells known as osteoblasts make their appearance, and it is moreover certain that these cells appear coincidentally with the invading vascular loop. There are no cells beneath the perichondrium that resemble osteoblasts and the cartilage cells do not resemble them in any way; so it may, I think, be concluded that the bone forming cells are brought to the ossification point and invade the cartilage with the bloodvessel. The details of the histogenetic processes; where the osteoblasts originate; whether they are actually derived from the ectoderm and brought to the area to be ossified from a distance by the bloodvessels; or originate in the same embryonic tissue as the skeletal anlage generally, do not concern us at the present time. What is important in the present connection and what is, moreover certain, is that the osteoblasts are neither changed cartilage cells nor changed connective cells; but cells that are of independent origin, which are deposited under, but do not have any direct connection with the so-called perichondrium. Thus the perichondrium does not, as is usually stated, become converted into the periosteum. The underlying osteoblasts become closely attached to the cartilage beneath and induce no change in the connective tissue envelope; nor does the latter apparently influence the growth of the osteoblasts except in so far as it retains the osteoblasts within limits and prevents the invasion of the neighboring tissues.

Both epiphyseal and membranous bone originate in the same way as the so-called periosteal bone. At a certain time one or more bloodvessels from the medullary cavity, instead of ending at the epiphy-

*Presented before the Orthopedic Section of the New York Academy of Medicine.

seal line, penetrate it and terminate at a variable distance from the joint surface. These bring with them osteoblasts and thus the epiphyseal centre of ossification is laid down. In membranous bone the vascular loop invades the connective tissue instead of the cartilage but otherwise the centre of ossification is laid down and bone formation proceeds exactly as it does in the epiphysis.

Though some authors believe that the osteoblasts form bone by the transformation of the cell body, the evidence is conclusive that bone is formed by secretory or analogous processes. In any event, it is well established that once the osteoblasts have assumed the form and functions of bone corpuscles, they, like all highly specialized cells, are no longer capable of propagating themselves.

This being true, it is evident that the growth and development of bone are dependent entirely upon the presence and proliferation of the osteoblasts. Moreover, as these cells are, throughout adult as well as embryonic life, restricted to certain localities, viz., the cambium and the marrow, the development of bone is confined to these regions. For this reason bone grows in thickness by the deposition of new bone upon the periphery; it grows in length, not by virtue of interstitial proliferation of the bone cells, but by the proliferation of the cartilage cells at the epiphyseal line; in either case the osteoid tissue is deposited by osteoblasts, which, once they have accomplished this, are no longer capable of proliferation. When bone changes its shape this is accomplished by absorption of the already existent bone and the deposition of new bone by osteoblasts in such a manner as to produce the change in form.

These conditions are so unequivocal that it hardly seems possible that controversy regarding them should exist. Yet in spite of the classical work of Ollier which is a complete demonstration of their accuracy, there still exists some difference of opinion as to the details of bone development particularly as these are related to bone transplantation. For the most part these differences of opinion are not founded upon a diversity in the actual findings; they are due to peculiarities in the interpretation of the facts, to purely theoretical considerations, but for the most part to a confusion of the terms used. Thus the question of the viability of the periosteum and its capacity to produce new bone when transplanted, revived by Macewen, although the question had been definitely settled to the satisfaction of practically all workers in the field, is immediately answered when the terms used are unequivocal. If by periosteum is meant not only the connective tissue envelope but the cambium layer as well, i. e., the layer of osteoblasts beneath it, there is no longer any doubt about the matter. For as Ollier and many others after him have shown, such transplants, even when implanted in apparently unfavorable localities, are capable of producing new bone. That a transplant consisting solely of the connective tissue layer of the periosteum will be unproductive is selfevident. All that is needed to end the controversy regarding the productivity of the periosteum, is a distinct understanding that the osteoblasts are the influential factors in bone pro-

duction; that when we speak of the productivity of the periosteum we mean the cambium layer containing the osteoblasts; and that in this sense and in this sense only, we consider the periosteum viable and capable of forming new bone when transplanted. This explains why regeneration is more complete when a thin layer of bone is left on the periosteum when bones are resected. When a thin layer of bone is left attached to the periosteum, the cambium layer with the osteoblasts remains uninjured *in situ* and thus the chances of regeneration are greatly increased.

Equally decisive is the evidence in regard to the transplantation of bone with and without the periosteum. It is true that pieces of bone can be transplanted successfully when denuded of the periosteum, but this is possible only when osteoblasts from the deep layer of the periosteum or the endosteum, which also contains osteoblasts, remain attached. What is true of the periosteum as such is also true of the bone; it is not the bone but the osteoblasts which are the influential factors and it is upon them that the success of the transplant depends.

As a matter of fact even pieces of bone with periosteum and osteoblasts attached, die when transplanted. Indeed it has been shown frequently that pieces of bone removed and reimplanted into the gaps from which they were taken, do not as one would suppose, grow in and resume their functions. Surprising as it may seem, even these favorable conditions and the presence of both periosteum and endosteum are not sufficient to insure the continued existence of the reimplanted bone. The bone corpuscles are found degenerated and all these grafts are slowly but surely absorbed.

How then can we explain the final outcome? The explanation is simple and readily deducible from what is known of the original development of bone. It has been demonstrated by others and my own work fully confirms this, that what actually takes place is a more or less complete regeneration of the implanted bone as it is being absorbed. That is to say, when we transplant bone periosteum or endosteum, we are simply repeating artificially what occurs when bone is being developed. We carry osteoblasts to a favorable locality just as do the bloodvessels that inaugurate osteogenesis in the embryo.

If all this is true, how, it may be asked, are we to account for the fact that bone denuded of both periosteum and endosteum has been successfully used as a graft? Or, what seems even more paradoxical, how can we explain the fact that heterogeneous bone, boiled bone and even ivory have been successfully used as grafts? This is not so difficult to explain as at first appears. It has been shown beyond doubt that such grafts are absorbed or extruded when transplanted into foreign soil. When reimplanted into healthy bone a callus is formed and in favorable cases the graft is firmly held. When this happens the clinician considers the graft successful. Indeed, Macewen and others consider this evidence that bone denuded of both periosteum and endosteum is viable and continues to live when transplanted. But, as is to

be expected from what has already been said, those who have studied the conditions more carefully and over longer periods have found that the grafts themselves are not permanent. The bone corpuscles are found to be disintegrated a short time after the reimplantation and these, like all other grafts, soon show signs of absorption. Under favorable conditions, however, osteoblasts from the adjacent healthy bone invade the graft and deposit bone upon or in the interstices of the implanted material; and only when the osteoblasts are present in sufficient numbers and proliferate so rapidly that enough bone is deposited to balance the dead bone lost by absorption, is such a graft permanently successful.

When viewed in the light of these facts, our conception of the biology of bone transplantation becomes clarified. It no longer rests upon the theoretical interpretation of individual findings, but is based upon a definite knowledge of the development of bone and the experimental and histological demonstration of the conditions as they really exist. We conclude then: That bone dies when transplanted whether supplied with periosteum or not. The success of the transplant depends upon the development of new bone. Bone is produced solely by osteoblasts. The osteoblasts are always confined to the cambium layer of the periosteum or the endosteum. (The osteoblasts are also found in the

bone marrow). Therefore, when the transplant consists of bone denuded of both periosteum and endosteum, the osteoblasts must come from the healthy bone into which it has been implanted. On the other hand, the grafts which retain these structures are already supplied with osteoblasts; and as these cells are excited to proliferation when in contact with dead bone, the regenerative process is greatly increased in rapidity and extent and thus the chances that new bone will be developed before the transplanted bone is completely absorbed are greatly enhanced. In a word, regeneration is more certain when the transplant already contains osteoblasts than when these cells must make their way from a distance.

We need then no longer concern ourselves with the theoretical question as to the possibility of successfully transplanting bone denuded of both periosteum and endosteum. It may be conceded that such grafts will be successful under favorable conditions. From a practical viewpoint, however, it is evident that the graft with both periosteum and endosteum is much more likely to insure a permanent result; a fact that has been borne out by clinical experience and well established by the experimental as well as the histological investigations of many competent workers.

110 EAST SEVENTY-EIGHTH STREET.

The Rectovaginal Septum in Proctology*

By DESCUM C. McKENNEY, M. D., F. A. C. S.,
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Proctologists and gynecologists have common interest in the treatment of diseases involving the anorectovaginal septum, the partition separating the lower end of the intestinal tract from the vagina, which I shall refer to as the septum. The upper portion of the septum, where the rectum is in close relation with the vagina, will be designated as the rectovaginal portion; and the part corresponding to the anal canal as the anovaginal portion.

Damage to the septum, from which much of the pathology arises, occurs at labor on the vaginal side and hence repair has been made by the gynecologist, usually with little or no thought of the alleviation or cure of anorectal diseases, with which the damaged septum is so often found associated. Likewise rectal conditions have been treated by the proctologist without proper regard for the great necessity of coincident repair of the septum.

To be able to place the proper value on symptoms that arise from traumatism to the septum, one must briefly review the anatomy of some of the structures of the pelvic floor, of which the septum is such an important part. Those of chief interest for the purposes of this paper are the perineal body, the levator ani muscle, and the fascia forming its sheath.

These structures are essential to the support of the viscera in the pelvis. On their proper functioning depends in a great measure the ability of the individual to increase intraabdominal pressure at will and to perform satisfactorily the act of defecation.

The perineal body, roughly triangular in shape, lies between the anterior wall of the anal canal and the posterior wall of the lower end of the vagina. It is the central point of strength of the pelvic floor and the meeting place of the many important structures forming the floor.

The pubococcygeal portion of the levator ani muscle arises from the inner surface of the body of the pubic bone and its horizontal ramus, passing backward on either side of the vagina, about three quarters of an inch inward from the introitus. Some of the fibres blend with the vaginal wall and the structures of the perineal body. It then continues backward on either side of the bowel, at the juncture of the rectum and anal canal, and is inserted in the anococcygeal ligament and the last two segments of the coccyx. It forms a veritable hammock, the padding of which is the cellular tissue of the broad ligaments with their many vessels. Lying in this hammock, from the coccyx to the anal canal, is part of the rectum; and anterior to the rectum lies the vagina. From its relation to the vagina and rectum,

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it is quite apparent how it acts as sphincter of both. The levator ani is thin, and not strong, but is made resistant by the endopelvic fascia on its upper surface and the anal fascia on its under surface. These two layers of fascia form a sheath for the muscle and are blended in the perineal body. A portion of the endopelvic fascia separates the rectal and vaginal walls, thus forming the thin rectovaginal portion of the septum and giving it what little resistance it has.

Let us regard the perineal body as a movable centre, pushed forward when anything is extruded from the rectum, backward when anything is extruded from the vagina, and lateralward when there is an abnormal fetal delivery. The levator ani muscle, by its forward and upward pull toward the pubic bone, holds the posterior rectal wall against the anterior, and, by means of the perineal body, the posterior vaginal wall against the anterior. In this manner at the juncture of the rectum and anal canal a right angle, open backwards, is formed and maintained. This action of the muscle can easily be demonstrated in the nullipara by pricking the vulva with a pin and watching the contraction (Penrose). When this movable centre and its component parts have been torn in labor, effectual contraction of the muscle is no longer possible, and the pull in a forward direction becomes negligible. This fact is readily demonstrated by the lack of response to the needle prick test, or by the index finger pressing gently in either vaginal sulcus, while the patient attempts voluntary contraction of the muscles of the pelvic floor. With the forward pull gone, the rectoanal angle is obliterated. The anal canal falls backward towards the coccyx, thus allowing slack in the rectovaginal portion of the septum. This slack makes possible the formation of a rectocele, which is virtually a hernia of the anterior rectal wall.

Rectoceles vary greatly in form and in size, depending upon the degree of damage to the septum and upon intraabdominal pressure. Heavy lifting, defecating, or a subsequent labor, by further weakening the septum, increases the size. Such acts of straining tend also to force down and perhaps out of the vulva the pelvic viscera, adding the symptoms of ptosis to those of the septal lesion. As the rectocele increases in size there is more tugging on the base of the broad ligaments. Torsion of the bloodvessels follows, and all the symptoms due to congestion arise. The rectal veins become engorged and hemorrhoids result.

When the perineal body is intact, and there has been a submucous tear of the fascia of the rectovaginal portion of the septum, there will be a pocketing of the rectum, pushing in front of it the vaginal wall. This pocket may vary in size from a thimble to a turkey egg. It may be so small and so high in the vagina that it does not appear at the vulva, and a careless examination may not discover it. It may be so large that it hangs over the perineal body and is plainly evident.

When the perineal body and the fascia of the rectovaginal portion are damaged, and the external sphincter is not, the pouching may begin just below the rectovaginal excavation (culdesac) and end at the external sphincter ani, filling completely the introitus and bulging out of it, thus making defecation

impossible unless the patient holds back the tumor with her hand.

When there is a complete tear of the perineal body—the anovaginal portion of the septum—the fulcrum over which a rectocele forms becomes a slit and there can be no rectocele. The reason is, that no portion of the movable centre remaining intact, the intestinal and genital outlets become sphincterless passageways, affording no resistance to intra-abdominal pressure. Hence there is no strain on the septum to cause it to bulge and be visible, although the weakened condition can easily be made out by palpation. This, compared with the varieties of rectocele mentioned above, is by far the most distressing. In this condition, should the fulcrum be restored by repair of the sphincter only, the rectocele will later appear.

Not rarely there appears at the vulva what seems to be a rectocele but which in reality is not. In labor, during the progress of the fetal head, the mucous membrane of the posterior vaginal wall is forced loose from its base, and *en masse* is pushed in advance of the oncoming head until it reaches a point near the fourchette. In this location this massed mucous membrane remains and simulates a rectocele, unless involution restores it to its original position. The diagnosis of this false rectocele is easy. The tip of the index finger, inserted into the rectum, does not go to the apex of the tumor, which can, at the same time, be grasped between the thumb and index finger of the other hand and be found to be independent of the perineal body. This, ordinarily, requires no treatment.

What part does the septum play in defecation? During the act of defecation fecal matter is forced into the rectum, toward the coccyx, and against the thin rectovaginal portion of the septum. The tonic contraction of the levator ani, pulling the rectoanal angle forward, guides the feces into the anal canal; and finally, by voluntary action, the levator ani pulls the relaxed anal canal over the last of the fecal mass and closes the lower end of the rectum behind it. Then the sphincters ani contract and the act is completed. From this it will be seen how essential are the component parts of the intact septum to the proper performance of defecation.

DISTURBANCE OF FUNCTION.

To show the disturbance of function in defecation, when a rectocele replaces the normal septum, a simple experiment is most illuminating. It consists of the insertion into the rectum of a solid rubber ball, an inch or less in diameter, with a string attached but hanging outside the sphincter, to facilitate the recovery of the ball. The patient is asked to attempt to pass it. When the septum is normal, or there is a false rectocele as mentioned above, the ball follows the normal course of the rectum and is directed into the anal canal. In the case of a true rectocele, the ball is seen and felt to enter the apex of the pocket.

Another experiment, demonstrating the same thing, is to insert an anoscope of the Kelly type, with its obturator in place, the full length of the anal canal, and then have the patient strain. The tip of the instrument will be forced toward the apex of the rectocele; but, if the obturator is removed and

the instrument left in place, thus holding the sphincter open, straining does not change the position of the instrument to any extent, but forces the mucous membrane of the anterior rectal wall into it.

The three cardinal symptoms of rectal disease—pain, prolapse and discharge—generally cause the patient to seek relief; whereas the symptoms of the associated damaged septum, no matter how important, are, perhaps, from her point of view, less disturbing, so advice is not sought. Hence the septal condition is likely to go undiagnosed and untreated.

The more prominent symptoms calling attention to the damaged septum are as follows:

A not uncommon complaint is a bearing down feeling, as though everything were coming out. This is partly the result of the rectocele, but the tendency of the pelvic viscera to prolapse may share the responsibility for this symptom. There is often a sensation as though the bowels were going to move through the vulva. Following defecation, there is a sensation as if the act were incomplete, but this may also be produced by certain distinctly rectal conditions, such as hemorrhoids, polypi, and hypertrophied anal valves.

Difficulty is often experienced in starting the bowel movement, due to the abnormal direction taken by the feces when there is a rectocele. The reason for this symptom, as well as the complaint of tight sphincter and paralysis of the bowel, which one so often elicits from the patient, is well explained in the two experiments mentioned above.

Some patients with large rectoceles may have regular bowel movements, and, perhaps for a long time, no symptoms; but, sooner or later, as the bowel movements are usually incomplete, symptoms appear. It is quite common, when there is no rectocele, to find the rectum packed with scybala, but it is more common when there is a rectocele.

When constipation is present it is sometimes due to the fact that the individuals have restricted their diet, taken various cathartics and copious hot enemas for the relief of symptoms, real or imaginary, until they believed it impossible to have a bowel movement unless such treatment were continued. It would be impossible to estimate with any degree of exactness the extent to which constipation results directly from the damaged septum, but unquestionably such injury makes even incomplete defecation difficult.

Sacral backache may be a symptom of the rectal condition, but it may also be a symptom of a rectocele, with the frequently associated ptosis of pelvic viscera and the congestion resulting therefrom. To make a correct diagnosis and institute appropriate treatment of both the rectal and septal pathology, the examination of the parous patient must at all times be both rectal and vaginal.

TREATMENT.

The importance of an intact anorectovaginal septum cannot be questioned. Inasmuch as we are so often called upon to treat rectal diseases, in patients suffering from pathological conditions of the septum, the necessity of taking care of both conditions is at once evident.

Internal hemorrhoids of the first degree—those

that do not prolapse—are usually cured by repair of the septum alone. Internal hemorrhoids of the second and third degree—those that prolapse at stool and return unaided, and those that prolapse and require manual assistance for their return—require operation; and, if there is also a rectocele, this, at the same time, should receive surgical treatment. In certain cases, in the internal hemorrhoidal area anteriorly, there is prolapse of the rectal mucosa, without a distinct hemorrhoid in the same location, although internal hemorrhoids may be located around the rest of the circumference. Removal of the hemorrhoids and repair of the septum, ignoring the mucous membrane anteriorly, is all that is necessary.

In case of a rectal or anal fistula, an abscess, or any other purulent rectal condition, it is advisable to operate on the rectal condition first, and not to attempt the repair of the septum until a later date. We should bear in mind that when the rectocele has associated with it, disease of the cervix and anterior vaginal wall, requiring surgical intervention, all should be given attention at one operation. Repair of the rectocele alone would increase the difficulty of the repair, at a later date, of the cervix and anterior vaginal wall. Where there is ptosis, a laparotomy may be required in addition, in order to restore and retain in proper position the pelvic viscera. In clean cases there should be no hesitation in repairing the septum at the same time that one does the necessary anal or rectal operation.

The ordinary surgical preparation of the vagina and rectum should be made. It is preferable to do the rectal operation first, following the method in which the operator has had most experience. When this is completed the vagina and perineum should be again thoroughly cleansed. Before the vaginal operation is commenced, several thicknesses of toweling should be clipped to the skin transversely across the perineum, to avoid any possible contamination of the field of operation; and during the operation a continuous stream of some mildly antiseptic solution reduces still further the chance of infection.

There are many methods of repair of the septum, and it matters little how it is accomplished, if one bears in mind certain general principles upon which are based the successful operations. These principles are: The separation and elevation of the posterior vaginal mucous membrane from the rectal wall as far upward as the culdesac, if necessary; the infolding of the rectal wall, and the maintenance of it in this position by bringing together above the fold the rectovaginal layer of endopelvic fascia; the formation of a new perineal body by bringing together from either side the edges of the levator ani muscle and other structures intimately associated with it; the obliteration of all dead space; the trimming away of redundant vaginal mucous membrane, and the closure of the wound.

Inasmuch as anorectal diseases have frequently associated a damaged septum, and, inasmuch as relief of the symptoms of these two conditions add so much to the comfort and well being of the patient, I strongly urge the treatment of both at one and the same time.

1250 MAIN STREET.

Some Observations on the Static Influence of Shortened Pelvic Muscles

By JOHN JOSEPH NUTT, M. D., F. A. C. S.,

New York.

As in a number of cases I have found the cause of round shoulders and other conditions of faulty posture to be due to limitations of normal movements of the pelvis, it seems worth while to draw attention to the fact that loss of function at the pelvic joints may be the basic factor in curvature of the spine, in cases of lower back pain and in young adults who exhibit a marked awkwardness in dancing and athletic sports.

All of the muscles about the hip have more than one function, but selecting the muscles according to the preponderance of their action, we may consider the flexors of the hip as being the psoas, iliacus rectus femoris and the sartorius and the extensors as the glutei and the ham strings. The flexors of the hip increase the inclination of the pelvis. The extensors of the hip decrease the inclination of the pelvis. The inclination of the pelvis is also increased by the quadratus lumborum, and decreased by contraction of the rectus abdominis. The lateral inclination of the pelvis will be influenced by the abductors and adductors of the hip, more especially by the former. The principal abductors of the hip are the gluteus medius, gluteus minimus, and the tensor vaginae femoris, although other muscles, especially the anterior part of the gluteus maximus enter into this action. The chief adductors are the longus, magnus and brevis together with the pectinius. In different positions of the thigh the action of the muscles vary to some extent, as in flexion of the hip the tensor vaginae femoris becomes a flexor.

The matter to which I wish to call attention is the possible existence of contracture of the flexors and extensors of the hip, and of the quadratus lumborum of so slight an extent as to escape detection under ordinary circumstances. Our examination of the mechanism of the pelvic joints is usually cursory, and if there is no indication of inflammation, the idea of an existing abnormal condition is quickly dismissed. I do not wish to include under this heading those cases of protuberant abdomen and lordosis following weakness of the abdominal muscles.

CASE I.—An overgrown boy of six feet, seventeen years of age and a freshman at Columbia College, referred to me for round shoulders. The mother had done everything from admonition to shoulder braces to correct the increasing deformity. The boy was very studious, caring more for books than athletics, never even caring to take walks. He gave no other reason than that he enjoyed his books more. When sitting, he soon slid forward on the seat of his chair, and gave the appearance of sitting on the sacrum rather than his tuber ischii. His standing posture was one of slight lordosis with sway back and an increased curve of the dorsal vertebrae. His pelvis was unusually small. Examination showed that flexion at the hips was limited to

140°, attempts at further flexion caused tilting of the pelvis, decreasing its inclination with the horizon. Extension of the hips was also slightly limited, as was abduction. Systematic passive stretching together with attention to his study chair, desk, bed, manner of walking and standing, obtained most satisfactory results. After six months the boy stood erect, could walk with comfort four or five miles, and went into track athletics. His pelvis developed and its joints functioned normally.

CASE II.—Boy, aged sixteen years, five feet eleven inches. Six months previous to consultation had a slight injury resulting in pain in the back, diagnosed as a strain. About a month later upon getting up suddenly from the sofa where he was lying, had a sudden pain in the back which forced him to again lie down. He went to bed and remained for six weeks as the pain always recurred upon getting up. He had various treatments, none of which proved of great benefit. A radiograph was taken and blood tests made, but nothing discovered of a pathological nature. For the first three weeks in bed, he slept poorly but after that rested more comfortably and when he got up was free from pain for six or eight weeks. After violent exercise two weeks before consultation the pain had returned; rested in bed for five days, after which he felt better. No acute pain at present but sensation of weakness in the right leg.

Examination showed that plumb line erected from the centre of the pelvis fell half an inch to the right of the seventh cervical vertebra; slight asymmetry at waist line; right side straighter than the left; no rotation in Adam's position; forward bending gave slight pain in the lumbar region; the right anterior iliac spine was half an inch lower than the left. A. G. F. left 130°, A. G. F. right 135°. Extension slightly limited on the right side; no atrophy of the thighs or legs; feet pronated. Diagnosis: Lower back strain due to shortening of the extensors and flexors of the right hip. Treatment: cork insole in right shoe; instruction in the proper use of the feet and proper standing position; wedged sole and heels for the pronation, and passive stretching of the contracted muscles. Patient showed marked improvement in four weeks and markedly increased desire to enter into athletic sports and to dance. Formally dancing had been too awkward to afford any enjoyment.

CASE III.—A physician who had been ill three years previously and suffered from complicating phlebitis of the left saphenous vein, came to me complaining of pain in the back to the left of the second lumbar vertebra, rather constant, made worse by standing and more so by walking or other exercise. It had been present for three years and had not improved under various lines of treatment. For two years he had been unable to walk over five

blocks a day without being incapacitated for the following day and suffering great pain. The examination showed nothing abnormal at the feet except for slight shortening of the gastrocnemius, dorsal flexion 90° ; knee normal; restricted movement of the left hip; the angle of greatest flexion was 135° ; extension normal. Inclination of the pelvis when standing was increased. Diagnosis: shortening of the quadratus lumborum, the extensors of the hip, and the gastrocnemius. The systematic stretching of these muscles produced a marked relief from pain with the return of the ability to walk several miles with no distress.

The spot of pain described as being to the left of the second lumbar possibly had risen from the strain of that part of the quadratus lumborum, which arises from the transverse process of the second lumbar vertebra, and I think it would be well worth while in all cases in which an exact spot of pain is described in the lumbar region, to ascertain whether it may not result from a strain of one of the heads of this muscle.

CASE IV.—A young woman twenty years of age. When thirteen years old while raising her right foot in order to put on her shoe, she felt a sudden pain in her hip, was put to bed as she could not walk. After an uncertain time (weeks) was up and about. A few years later she suffered a gradually increasing pain about the right hip. This became so severe that amputation was advised but declined. Pains gradually subsided but she could not walk very much without recurrence. The condition was now diagnosed as tuberculous disease of the hip joint. Was put to bed and received hospital treatment. While in bed she felt fine, but when allowed up the trouble immediately returned. Has been a children's nurse for various lengths of time, but always finding it necessary to give up for a period of rest after a few weeks or months. She walked with a limp, which she said increased upon use, and with slight internal rotation of the leg. Examination showed a well developed young woman with a slight functional curve of the spine and a tilting of the pelvis. The hip joint showed no apprehension upon

forcible intraarticular pressure, passive or active. A. G. F. right 140° , A. G. F. left 130° . A. G. E. right 180° , A. G. E. left 200° . The leg was held in adduction of 10° . X ray showed coxavara without evidence of any bony structural changes. Diagnosis: strain due to limited motion about the hip joint. Treatment: passive motion, stretching of contracted tissues, high shoe on the right side, the height being lowered as the improvement increased. Result: after long walks or much dancing, left hip feels tired but not painful, otherwise no symptoms.

CASE V.—A tall young girl nineteen years of age, consulted me about her feet to which her physician had attributed the probable cause of pains which extended up her legs, thighs and sometimes to her back. She had had more or less difficulty with her feet, complaining of weak ankles. A year ago the right ankle turned in and caused pain which lasted several weeks. Disinclined to enter into any sports such as other girls of her age enjoy, saying she did not care for them. Walked very little, enjoyed reading and was bright in her studies. Examination showed: pronated feet with no deformities of the toes or foot; dorsal flexion of both feet 90° ; legs straight; knees normal; exaggerated lordosis. Flexion and extension of both hips limited. A. G. E. 185° , A. G. F. 140° . The traction shoe elongated the gastrocnemius, and passive stretching the contracted muscles about the hips. Lessons in the proper use of the feet and correct posture were given. Result: restoration of normal function of both limbs with no pain after exercise, and enjoyment, even zest for outdoor sports and dancing, which she had previously found distasteful.

CONCLUSIONS.

These cases are examples of a series encountered in both office and clinics. Doubtless many cures are effected by the manipulations and massage of irregular practitioners. When an examination discloses these pelvic contractures, the physician should himself perform systematic passive stretching. His personal attention will be appreciated, his treatments will be scientifically applied, and his efforts will yield most satisfactory results.

Observations on Abdominal Drainage*

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No apology need be made for bringing again to the notice of the medical profession the subject of abdominal drainage. It is a matter of the gravest interest and concern, that so many of these neglected cases of pus in the abdomen, especially in the light of modern teaching, should still be found in our general hospitals. Is it because we have failed utterly in our plain duty as teachers, or is it because the family physician has not adequately learned his lesson? May it be that the untutored layman has

been so terrified by the occasional operative death, that he shrinks from "the knife" until the last resort? Whatever the cause, the fact remains that many of these sufferers come seeking help and with a mortality so high that we are satisfied that the last word has not been spoken.

It is as much our imperative duty to teach the family physician in unmistakable terms the importance of referring these cases without delay, as it is to come here and exploit scientific truths and our successes in other fields, at these annual gatherings. I should feel it the most poignant humiliation if we,

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here and now, did not at least attempt to emancipate those ignorant of their duty from the thralldom with which tradition, the watchful waiting policy, the ice bag and purgation, have fettered them. In the words of Holy Writ, let us make this lesson so plain, "that he who runs may read." It is my purpose in this brief paper to touch upon only two or three phases of this problem.

Within the past year it has been my privilege to see several unfortunate conditions in these septic abdomens, which might be classified under the teachings of failures. Two patients in whom an appendicial abscess had been drained by rubber tubing, the inelastic and badly placed tube, by pressure and subsequent necrosis, had perforated bloodvessels with alarming hemorrhage. In another case a stiff drainage tube had been placed in contact with the cecum, at a point where its vitality had been compromised by the septic process. There was pressure necrosis with a resulting fecal fistula, and this did not close until a secondary abdominal section was done under the most adverse circumstances.

Two other patients, in whom only the larger abscesses were drained by the operator, the perforated appendix had been left in one case, deeply planted in the wall of the abscess behind the cecum, and in the other smaller hidden septic foci, including the rectovesical pouch. In both cases the surgery had been incomplete. One case terminated fatally; in the other, life hung in the balance but was saved, not by the surgeon, but by the patient himself, for he requested a rectal examination, thinking he had piles. The bulging abscess was incised by rectum, and the patient made a slow but satisfactory recovery. Had the dictum of MacLaren been heeded in this instance, and a rectal examination made, the situation would have been less humiliating to the operator.

No possible defense can be made for allowing a tube to be left in these purulent abdomens more than two or possibly three days. It is our practice to remove the original drains as early as possible, before the fibrinous exudate has crystallized into harmful adhesions. Of course, judgment must be exercised and each case determined on its own merits.

Moynihan has written that prolonged drainage of the peritoneal cavity is a physical impossibility; he speaks of how the gauze or wick becomes isolated and soon encapsulated, provoking a copious thin discharge from the serous surfaces which surround it, forming as Yates terms it, "a potential cavity which is speedily converted into an actual cavity" by the action of a plastic fibrinous exudate, forming encapsulating adhesions. Moynihan places special emphasis on a vital point now generally accepted, that "the use of gauze or rubber protective or tubes of any sort left in the abdominal wound, should be restricted to those cases where it is necessary to exercise pressure to arrest bleeding; or to isolate a part of the peritoneum when a known infection has occurred; or when the escape of a fluid along a track isolated from the peritoneum is anticipated (as in choledochotomy); or for temporary drainage of the general peritoneal cavity. The length of time during which drainage of the peritoneal cavity is pos-

sible has not been accurately reckoned, but it is almost certainly very brief, probably not more than twelve hours as a maximum."

Another objection to the familiar cigarette drain is that it frequently fails utterly to remove the purulent secretion. These soft cylinders are, as a rule, too tightly constructed, or they become kinked or pressed upon, and thus act as an obstruction to the exudate. Within the past year we have had occasion to remove many of these drains, and in some instances when cut in two they were found dry and unstained, and this was after they had been in place several days.

In preparing to deal with the suppurative appendix, while we prefer the gridiron incision, believing by its use there is less tendency to hernia, still we frequently use the right rectus entrance to the abdomen. The creation of a cofferdam, by the careful placement of moist compresses, thus isolating the gangrenous appendix, or any other source of infection, is a helpful and necessary part of the ritual. Let there be placed advantageously and with a feather edge technic as many properly constructed drains as may be necessary, after the free liberation of all limiting adhesions and the removal of the appendix, exposing and evacuating every pus pocket. If there has been a general invasion of the peritoneal cavity, the placing of a large sized drain into the very bottom of the pocket behind the male bladder, or the culdesac in woman, is commonly accepted as a necessary part of the pelvic toilet. Much credit for standardizing this technic belongs to Van Buren Knott (1).

The drainage tube we have found most satisfactory may be constructed in one of two ways. A soft, new rubber tube the size of a pencil is split or cut spirally and wrapped loosely with a piece of gauze, and this is carried through a cylinder of rubber dam; or, instead, there may be used a specially large split tube of soft rubber, fully a half inch in diameter, containing as a core a strip of washed iodoform gauze.

In these cases of general septic peritonitis, whether the aspirating catheter of Deaver has revealed the presence of pus in the pelvis or not, I am convinced that any drainage short of this, as Knott has so emphatically written, will fail to reach the pockets of pus on the way to and in the pelvis, concealed as they are by the many limiting adhesions. With this technic and the influence of gravity posture, the proctoclysis and its far-reaching influence, and other postoperative measures so familiar to you all, I am sure the high mortality in these neglected cases will be reduced, and the postoperative sepsis seen too often, manifested by hepatic abscess, phlebitis, subphrenic abscess, and empyema, will be reduced to the minimum (1).

An interesting observation regarding the abdominal pack comes from Maylard (2). He summarizes as follows: 1. If the packing is employed in septic cases without the adjunct drainage of a tube, the gauze may act as a dam. 2. The irritating effect of gauze on neighboring coils of healthy bowel leads to a low form of adhesive peritonitis which may end in obstruction. 3. The longer the wound is kept open the more likely is the chance of the

ventral hernia. 4. Withdrawal of gauze is a very painful process. Maylard seems to be very emphatic in defining its limitations, preferring to use only the smallest piece possible when absolutely necessary.

It is our plain duty to provide for the escape of the death dealing pus and to remove the perforated appendix or repair the open viscus. But, as Mumford has interestingly observed, we must not stop at this, we must encourage in every way the secretory organs, the kidneys most of all, to take up their allotted tasks; we must nourish the organism, quench the thirst, stimulate in the proper way the flagging circulation, and subdue the pain. We must further remember when the abdomen is open, that any undue manipulation of the bowel encourages paralysis of peristalsis, postoperative ileus, in a body already exhausted and overwhelmed. In short, after we have completed an approved piece of surgery, we must be mindful of the fact that we are dealing with a brother man, and not simply a case number.

One point further regarding the cases of intraperitoneal abscess in the lower abdomen, the case which has not received proper drainage, the patient who is not doing well and seems to be rapidly and surely approaching the inevitable *exitus lethalis*; the sunken eye, the rapid pulse and respiration, the spitting up of dark fluid from the stomach, distention, muscular rigidity, intestinal paresis, Nature's last struggle against the invading foe, the telltale picture of concealed pus and peritonitis. How often we have watched these cases go to a fatal ending, perhaps reopening the abdomen a few hours before the passing, in a vain effort to relieve the cause. Dr. Archibald MacLaren has repeatedly urged the importance of a rectal examination, many times he has opened and drained through the rectum these neglected

abscesses and converted a defeat into a victory.

We have all profited by Crile's splendid idea of anociassociation. In these cases we have repeatedly followed his teaching with almost dramatic effect: The large hot pack, glucose and soda by rectum, preliminary lavage, physiological salt solution subcutaneously, and the judicious use of morphine, until the danger is past and recuperation begins.

A further observation; incomplete surgery is not only the crime of the occasional operator, but too often may be charged against the skilled technician. If you would diminish the mortality in cases of septic abdomen, remove the gangrenous appendix, the pus tube, search for and close the leaking intestinal ulcer, correct the defect, wherever it may be, and repair the damage done by adequate drainage. Never back out of these distressing peritoneal infections because, forsooth, the task seems difficult or impossible; do not bring reproach to your last fifteen minutes, finish the job.

I believe we will agree that in the vast range of vital problems that confront the medical profession there is none more important than well balanced judgment in the drainage of the septic abdomen. I have not attempted to cover the entire field, but have endeavored to place on the road we travel a few finger boards to be marked by white stone, facts supported by observations and experience drawn from the hospital wards and the operating table, hoping it may stimulate profitable discussion.

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The Problem of the Immature Cataractous Lens*

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It may be taken for granted that it is not necessary to approach this subject from an argumentative viewpoint, and that many of the essentials incident to the problem are admitted. Chief among these is that any condition which leads up to permanent damage to the clarity of the lens, which militates against clear vision, the comfort of the individual, or the maintenance of his useful activities, should be remedied, provided that this can be done with a reasonable prospect of success and with little risk of immediate or future loss of functional integrity. In this is formulated the major premise, but in the proviso lies the crux of the whole matter. It is admitted, also, that a partially opaque lens presents operative difficulties, and that attempts for its removal are not justifiable in view of the immediate risks or future changes which these may entail.

It is not necessary for me to explain that these are

generalities. There are particularities dependent upon the age of the patient, the degree of sclerosis, or the type of the lenticular opacity, which may nullify these difficulties and make for a clean extraction; but, in the main, the rule as has been stated holds. More than this, there is nothing to tell us to what degree these factors are operative, nor what, from the appearance of the lens, will be its behavior at operation. That the dangers are immanent, witness the many procedures which have been devised to hasten the opacification and operability of immature cataracts, transcorneal multiple punctures into the lens, a large iridectomy, subcapsular infiltration with normal saline or massage of the capsule through a corneal incision. There may have been others, but they have all fallen into merited oblivion. In the day when "those that look out of the windows be darkened," waiting is no longer considered wise counsel, nor is the sufferer from partial opacity of the lens to be condemned

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to mental and physical distress of uncertain tenure.

At any stage of obscurity, restoration of vision may be promised at a minimum risk, and there remains only the selection of the method whereby this may be attained. The choice must lie between removal of the lens in its capsule or the operation advocated by me. Removal in the capsule involves, first, a forcible rupture of the zonula, and, second, the extrusion of the lens from the eye. There are five procedures, any one of which may be used to attain the first objective, and are executed after the corneal section.

First: Pressure applied over the cornea at or near the sclerocorneal margin, directly backward toward the nerve head and opposite the midpoint of the corneal flap.

Second: Pressure applied, with a specially devised spatula, over the convexity of the lens near the equator, alternately on either side, then above and below until the lens is loose in the patellar fossa.

Third: Traction exerted upon the zonula by transverse and opposite movements, the lens being held in forceps grasping the capsule.

Fourth: The same manœuvres, but the lens now being held in the cup of a suction apparatus.

Fifth: A rotation of the lens in the patellar fossa, the tractive force being obtained by a hook slipped into the lens near the equator.

In the first the rupture of the zonula and the extrusion of the lens are parts of the same manœuvre. In the second, third and fifth, the zonula is first ruptured and the lens delivered by external pressure; in the suction method no external pressure need be used. Incidentally, it is pertinent to comment on the fact that not one of these methods is new, the first being put into practice more than a hundred and fifty years ago, and scarcely one has received much more than a polite obituary. I think it may be safely said that anyone who operates by any one of these methods will admit that the technical difficulties are infinitely great, that facility is acquired only by much practice, and that the operator faces with greater equanimity a mature cataract upon which he is to operate by capsulotomy and by ordinary methods. Assuming that this is true, with what perfect confidence would he approach an operation where he knew in advance that the capsulotomy had been made assuredly ample, and that the lens, no longer bound to its capsular envelope, lay ready for release at the lightest touch. Where one's contentions are opposed to others, conclusions should not be formulated until the reasons are given for the quality of choice to serve in such a difference.

First, let me interpolate a few quotations from the writings of an operator of large experience. In sequence relative to my contentions these are:

1. "The aim of a cataract operation is to obtain the best vision with the least risk to the eye."

2. "One of the frequent complications of the ordinary capsulotomy operation is iritis," and "there can be no question but that in the intracapsular operation iritis is a much less frequent complication, at the same time it does occur, and a thickening of the hyaloid membrane, indicative of cyclitic involvement, is also observed."

3. "Loss of vitreous is correctly regarded as an

unfortunate accident, and while a slight loss of vitreous is frequently followed by good vision and a sound eye—particularly if it occurs after the delivery of the lens—it is an unpleasant complication which should not be minimized." "In the hands of the most skillful the minimum of loss is five per cent., in less skillful hands much higher." "In the capsulotomy operation in careful hands vitreous is practically not lost."

4. "It is a mistake to minimize the difficulties of an intracapsular operation," and "I have not been able to decide how much traction on the suspensory ligament it is safe to apply in attempting to dislocate a cataract," and in his closing sentences he says: "My own opinion is that the whole question narrows itself down to this: Are we justified for the purpose of attaining better vision in some additional cases to increase the number of poor results and failures directly referable to the method of operating? I think not." Such is his conclusion.

With this I am wholly in accord, and my agreement will carry greater emphasis if easy means to safety can be shown and how danger may be avoided by the alternate operation I propose. In no spirit of cavil is the comparison of these differing methods approached, but no argument can be complete without criticism and contrast.

The first of the procedures for removing the lens in the capsule, in my opinion, is unscientific, violates every law of surgery and mechanics, and subjects the eye to damaging traumatism, the effects of which are immediate in a subluxation of the vitreous upward and remote in the slow deterioration, which follows, to the functional integrity of the eye. I cannot bring forward greater corroborative testimony to this than by saying that these are, in substance, the statements made to me by Colonel Robert Elliott when he was in this country, and that in India, even though the surgical thought was dominated by the brilliancy of the one able exponent of this procedure, he had abandoned the Smith-Indian for the Smith-American operation, and that his successor in the Government Hospital at Madras continues to practise it with gratifying success. He was so good as twice to give public expression of his approval, once before the Clinical Congress of Surgeons of North America and again at a public function in Boston.

Passing to the second method—here the zonula is ruptured by successive peripheral quadrant pressure exerted backward. This is a revival of a very old procedure, and is, I think, now practised only by one operator; with what success is not on record, but this great objection applies, namely, that the margin of surety between too much and too little pressure is too narrow for safety. The method of traction where the lens is held in the grasp of a specially devised forceps applied to the capsule is less open to objection, inasmuch as the tractive force is away from the vitreous, but this procedure is not applicable to the intumescent cataract, and, again, the coefficient of safety is too low. Traction by a suction apparatus has its advocates, but the first American surgeon who practised it does so no longer. It surely requires a generous corneal section, for the lens plus the instrument must pass through

this on the delivery. It must possess an advantage in that no external pressure need be applied to the eye, but one can foresee a number of accidents that might happen and from which other methods would be free.

ROTATION OF THE LENS.

From a purely mechanical viewpoint, the rotation of the lens in the patellar fossa more nearly fulfils the law of equal resistance, for here the force is radially applied and at any given point on the fibrillary ring is less than in the other methods of rupturing the zonula. Leaving out of consideration the operation by expression and considering only those which employ chiefly traction to free the lens from its attachments, if we apply the laws of mechanics to this tractive force it can be easily seen that the resistance to be overcome varies inversely as the chord of the arc through which this tractive force is exerted. If applied to the anterior pole a nearly equal tension is exerted over a quadrant insertion of the zonula, no matter from what angle traction proceeds, and remains uniform in the successive applications at right angles or in the opposite direction. If the tractive force has its point of origin above or below the pole, and traction is exerted down or up respectively, the resistance progressively increases until the rupture extends to the horizontal meridian and progressively decreases until the last fibres give way. If the tractive force is applied below the polar diameter, the same law obtains, but now the upper fibres remain unbroken, the lens must tumble under extrusion pressure, and there results a breech presentation and the opening through which it is to be delivered must be correspondingly larger. If this space is only adequate to give exit to the lens in its normal position, the equator must be forced back into the vitreous until anteversion is complete. This accounts for the more frequent loss of vitreous at the time of the delivery of the lens.

From the foregoing it logically follows that the anterior pole is the proper place from which to initiate the tractive force. However, no matter which may be the choice of the methods just described, I cannot think that any operation which forcibly tears the zonula and which can inflict a damaging trauma to the ciliary body is good surgery, and even if it were, with the vitreous retained only by its trabeculæ, disaster hangs, like the sword of Damocles, on the strength of a single hair. If these were the only methods whereby the immature cataractous lens could be removed from the eye, we might, in view of the superlative benefits to be conferred, shut our eyes to their unsurgical features and to the risks incurred; but I trust that I may be able to show a better and surely a safer procedure; that by it all that is claimed for the intracapsular operation may be more easily attained, and that the operative risks are even less than are those involved in the extraction of a fully mature cataract.

NECESSITY FOR EXPERIENCE.

To how many would apply the warning not to do a certain operation until personal training had been received from one skilled therein, and not even then unless they were doing a hundred annually. In the four hospitals that do the most eye work in this

city, their last reports give, of all cataract cases—mature, immature, and complicated—which came to operation, a total of 1,108. To do these operations there were thirty-six surgeons, giving an average of thirty-one operations apiece. This falls somewhat short of a hundred operations a year, and for this particular operation I know of only two operators in this city who have received personal training. By these criteria we are all untrained, and occasional operators, and whatever skill our faltering hands may show has been acquired in the operation with capsulotomy. To the procedure herein advocated the usual technic is entirely applicable, and, in fact, simplified, for it makes sure and easy the capsulotomy, which is admittedly difficult. Probably no operation in surgery, and certainly none in ophthalmology, has been so provocative of intense and often acrimonious discussion as that for the extraction of the cataractous lens, mature or immature. There is a clear distinction between the good surgeon and the good operator. The former is the man who knows just what is necessary to be done, and when; how it is to be done is the function of the operator. In this he has his choice, and for him this way will be the best; but if he is both surgeon and operator he will have sound reasons for his methods, and will take heed to the experiences of those who have preceded him. That there is no absolutely perfect technic, witness the many variants on the blepharostasis, fixation, section, iridectomy, capsulotomy, expression and the toilet of the eye. There are advantages and disadvantages in every one, and when my own methods are presented it will not be with any claim for perfection, but because these meet my own needs and fulfill those of the objects to be attained.

PREVENTION OF SEQUELÆ.

Having expressed my objections to the intracapsular operation from the technical, surgical and mechanical points of view, and how these should be the determining or the deterrent factors for the occasional operator, I am prepared to admit that, if all goes well, nothing could be more beautiful or productive of brilliant results, but that qualifying *if* looms large to one who has witnessed many intracapsular extractions. The objections which were raised against the classical operation are in large part no longer tenable, for they were based on older experiences which modern methods have largely modified. Chief among the objections urged are the frequency of iritis and the occurrence of secondary opaque membranes in the pupillary area. These are coupled, for they are mostly due to the same cause; lens matter left behind acting as a foreign protein to set up iridic irritation augmented by the trauma incident to the iridectomy. Alone of all the tissues of the body the lens seems to live a charmed existence, endowed with endless growth, and any epithelial residue left clinging to the capsule often proliferates to draw the curtain behind the opened window. The preventive of these sequelæ is to leave none of the lens fibres in the eye. It is here pertinent to interpolate an exception to the claim that a large capsulectomy will give facile exit to the semiopaque lens matter from the capsular envelope. The capsule is not elastic; it is held taut

by the reefing lines that bind it to the ciliary processes, and an extraction by capsulectomy leaves behind circumferential pockets with retained lens matter and a central more or less clear area whose clarity is menaced by later outgrowths. The necessity for a needling operation, which was held to be the great drawback to the capsulotomy operation, need no longer be a deterrent if there is nothing left to needle. The posterior capsule has a thickness of but one five hundredth of an inch, and, if swept clean, only a diaphanous veil is left in the eye.

Having set forth the argument against intra-capsular extraction and reconsidered the chief objections to its classical predecessor, let me once more present the method which, with later modifications of proven worth, escapes the dangers of the one, increases the efficiency of the other, and puts mature and immature cataract on an equal operative footing. Incidentally, this method permits of a safe and speedy extraction of the clear lens in high myopia, in Morgagnian cataracts eliminates the difficulties to an ample capsulotomy, and, if followed in mature cataracts makes easy an ample opening in the capsule and facilitates a clean exit of the lens.

TECHNIC.

In an operation whose every step has been most minutely elaborated, and in which minor variants have been equally the source of fulsome praise and rabid denunciation, it is left for every operator to choose for himself in what manner he shall proceed, but he should have good reasons for his choice. It is only necessary to submit these briefly and with little argument.

First, the blepharostasis: In my opinion, for this nothing equals the Skeel speculum. It holds the lids apart to a predetermined degree, it does not press upon the globe, and it may be instantly removed with one hand in case of necessity.

Second, the fixation: A crossbilled forceps applied over the insertion of the internal rectus muscle. This will neither tear nor tear out, is the logical counterpoint to meet the pressure applied in making the corneal section, and prevents the rotation of the globe away from the knife as it enters and leaves the anterior chamber.

Third, the section: This should be proportionate to the size of the body which is to pass through it, and amplitude is the first consideration. It should begin and end just within the limbus and finish with a conjunctival flap. The knife should be two and a half millimetres wide, thirty-two millimetres long, have a straight back, be hollow ground and very sharp.

The technic of iridectomy has been practically agreed upon, but whether or not it shall be done has not been settled. Two things, however, are certain—a simple extraction gives better visual and cosmetic results, and an intact iris can form no adhesions to tags of capsule. We shall not consider cases in which the iris lacks the lustrous appearance of health or when its rigidity is indicated by a pupil of slight dilatibility; such always require an iridectomy and to the removal of cortical debris; more-healthy irides and dilatible pupils election is given to simple extraction. That this has not been the choice of others is because by former methods there

were difficulties encountered to an efficient capsulotomy and to the removal of cortical debris; moreover, there was the added danger of an iris prolapse. These were not negligible factors, but are largely so when a preliminary capsulotomy has been done, and especially when the eye has been thoroughly atropinized.

CAPSULOTOMY.

The matter of capsulotomy has been left to the last, where it properly belongs in the sequence of the old operation, but is first in time and importance, by the method here advocated and distinguishes this from other procedures. It is not altogether easy to do and is impossible except with the knife designed especially for the purpose. It is not humanly possible to devise a faultless operation for cataract, nor is any method free from dangers and drawbacks. In the one I have made my own, its single disadvantage is only an inconvenience since twice must the technic of asepsis be carried out and twice in the same day must the surgeon operate upon his patient. That infection might be a double risk has not been borne out by the statistics, as so far this has not been met with.

There are, however, two very real dangers, one of them being that the lens may be dislocated in doing the capsulotomy, which is chiefly the fault of an improper instrument. If the knife has not the proper shape nor made very sharp to the point, it may catch in the lens, and if bungling attempts are then made to cut the capsule, the lens will be dragged loose from its moorings. A perfect knife and ophthalmic fingers will insure an ample and an easy crucial division of the capsule.

The second danger, and the only one to be feared, is increased intraocular tension arising before the usual six hour waiting interval has elapsed. To meet this properly the eye should be finger tested from time to time, and if recognized that the tension is rising, the waiting period should be cut short. Fortunately this complication does not often occur, but if it does a slight modification of the technic will avert disaster. Let the section remain incomplete by leaving a broad conjunctival bridge, remove the speculum, apply a pad of warm, moistened gauze over the eye, holding this firmly on for a few minutes. Have the upper lid held up and away from the globe on a lid retractor, divide the conjunctival bridge with a pair of scissors, and proceed as usual to the delivery of the lens. Some operators have made this conjunctival bridge narrower and delivered the lens along its nasal border. There are some advantages in this, but the delivery of the lens is less easily accomplished.

Herein I have with the utmost frankness presented all that has been or may be said against this operation. Admitting them all, they have little weight as against the many and great advantages of this over any other method which attempts to safely and successfully meet the difficulties inherent to the extraction of the immature cataractous lens.

I know of nothing more difficult than to convey to others, by mere description, a clear concept of any surgical procedure so that he who reads may execute it exactly as does its originator. Hence it follows that variants occur, some madvisedly, some

from lack of understanding, and others from attempts at improvements. They who essay the latter are perhaps unaware that in the evolution of a technic many of their variations have been tried and rejected.

TECHNIC OF OPERATION.

We will assume a wise selection of the case which is to be the subject of this operation. Let there be normal tension, a healthy iris, and a mobile dilatable pupil, the degree of lenticular opacity is wholly immaterial. The initial step—and this may seem inconsequential—is to close trim the lashes from the outer half of the upper lid, which shortens by just so much the time that the speculum needs to remain in the eye and any loose hairs are at once detected. Next the eye is atropinized, three successive instillations, twenty minutes apart, these things being done by a nurse an hour before the time set for the capsulotomy. The sphincter iridis being thus paralyzed does not functionate, the pupil remains open during the operation, the irrigation is made more effective, and against an iris prolapse there is no greater safeguard.

The technic of anesthesia and asepsis having been carried out, the operator, securing his blepharostasis and fixation, stands at the head of his patient. This is his position for the right eye. The specially designed knife, held like a pencil, blade down, enters the anterior chamber through a puncture at the centre of the supertemporal quadrant, the blade carried down to the lower margin of the dilated pupil, its edge pressed against the capsule, and as the handle is made to describe an arc away from the operator, the blade within the eye describes a lesser arc toward him, and in so doing divides the capsule upon the vertical meridian. In executing this manoeuvre it is necessary as the cut progresses to lessen gradually the length of the shank in the eye, as the arc described by the blade must grow less as the space wherein it can operate decreases. Unless this is done either the blade will sink too deeply in the lens or will dislocate it. The vertical cut having been made, the blade is carried over to the pupillary margin on the opposite meridian, the handle is given a quarter turn toward the operator bringing again the blade in contact with the capsule. The arc described by the handle is now nasalward and the transverse cut made exactly as the other. The blade, now turned into its plane of entrance, is withdrawn from the eye and the capsulotomy is complete.

If for the left eye, the operator stands on the left side of the patient, and the knife enters in the inferotemporal quadrant and the first cut begins above, otherwise the technic is the same as for the other eye. The palpebral space is now flushed with normal saline, the lids of both eyes are held closed by narrow strips of isinglass plaster, and the patient put to bed in a quiet room for a period of about six hours.

RÉSUMÉ.

While we are waiting for the aqueous to insinuate itself between the cortex and the capsule and so separate the two, let us briefly review what we have gained and what are the advantages of this method over others in the extraction of the lens. In the

first place, we are assured of an ample capsulotomy done with an ease and certainty not otherwise attainable and, no matter what may be the state of the lens—clear, opaque or partially so—its later removal will be made equally easy with little or no cortical detritus remaining in the eye. The extraction proper which follows, at the expiration of the waiting period, differs in no manner from the usual method. The section and the conjunctival flap is made and the latter turned back over the cornea. This is now no embarrassment to the operator, as the step it tends to obscure in the classical operation has already been taken. Caution should be observed in the delivery of the lens, for this is attained so easily that not infrequently it occurs spontaneously with the completion of the section, and in any event only the slightest pressure is needed for the extrusion of the lens.

Once the lens is delivered, no matter how clear and black the pupil may appear, the anterior chamber should be irrigated with warm, sterile normal saline, for there may be clear lens fibres sticking to the posterior capsule. These are invisible, but present or not, nothing can so effectively remove whatever may remain of cortical matter. Eyes have been lost at attempts at removal of this by external manipulation, and from a purely anatomical and mechanical viewpoint the total clearing of the anterior chamber by the latter method is next to impossible. It is not to be expected that any method of extraction can be invariably successful.

A cataractous eye is a sick eye, and even a successful intracapsular operation will not clear up a thickened and cloudy hyaline membrane if this condition is consequent on the nutritive disturbance which caused the cataract. With preliminary capsulotomy and irrigation it is most certainly true that only in the rarest instances is a needling necessary, for nothing is left in the eye that can either become opaque or set up iridic irritation. Following the toilet of the iris, the conjunctival flap is smoothed back into place, atropine ointment is placed in the lower culdesac and the patient put to bed.

Perhaps at times my enthusiasm may have prompted me to statements that might appear dogmatic. So they might be thought did they rest upon my own unsupported assertions; but this operation is not an untried procedure, and six years ago I reported the results of 180 operations at the hands of other men. Of these there were ninety-one per cent. successes, six per cent. partial, and three per cent. total failures. These, be it understood, were all immature cataracts. Taking into account unfamiliarity with a new procedure at the hands of many men and comparing these with the average successes in fully mature and operable cataracts it is seen this method does not suffer by comparison.

The method is safe and goes far to solve the problem of the immature cataract. It involves no departure from time tried methods, nor is there a new and difficult technic to be mastered. It speedily makes operable cataract at any stage of opacification and assures a clean and easy delivery of the lens.

276 MADISON AVENUE.

The Simulation of Epidemic Encephalitis by Drug Poisoning*

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The incidence of epidemic encephalitis since the early months of 1919 has made the diagnosis of this disease important. When the malady first appeared the diagnosis most frequently made was meningitis, hysteria or uremia. Later on when the disease was better recognized it was natural that other conditions should be diagnosed as encephalitis. It is with this latter contingency that I wish to deal and to record two cases of drug poisoning, in both of which the diagnosis of epidemic encephalitis was made as a tentative consideration.

CASE I.—A woman, married, about forty-two years of age, was operated upon for appendicitis and made an uneventful surgical recovery. Because of persistent postoperative insomnia she was given five grains of luminal every night for six nights without any results until after the fifth dose had been taken. On the afternoon of the sixth day, and before she had had the last dose of luminal, she complained of headache and double vision. Her temperature at that time was 100° F. Following the last dose of luminal the woman went to sleep and remained in a stupor for six days. During this period she could be aroused only to fall again into a state of lethargy; she would stop talking in the midst of a conversation and had to be prodded to keep on chewing when she had a mouthful of food. She complained of extreme weakness, was unable to hold her head erect, and was scarcely able to raise her hand to her mouth.

Physical examination.—The appearance of the woman's face suggested a double third nerve weakness; the upper lids could be only partially elevated and the muscles of the forehead assisted in the action. The pupils were moderately dilated and reacted poorly to light. The face was smoothed out. The speech was indistinct and resembled to some extent that of general paresis. A universal hypotonia with a profound depression of the deep reflexes was noted; the plantar and abdominal reflexes were present and normal. The blood, urine, cerebrospinal fluid and eyegrounds were normal. The temperature did not go higher than 99° F. except on the one occasion mentioned above.

Clinical course and outcome.—For six days the woman was in a state of extreme lethargy. At the end of that time she gradually became brighter mentally although she still continued to sleep a great part of the time. An alarming asthenia persisted for two more weeks and was so severe that she could not hold her head erect for any length of time. She eventually made a complete recovery. No attempt was made to determine the character of her gait until the patient had regained a great deal of her strength and at that time it showed nothing different from what would be expected after a very severe illness.

CASE II.—A man, forty-six years of age, was admitted to the service of Dr. H. B. Allyn, at the Philadelphia General Hospital, in February, 1921. When brought in the man was in a semistuporous condition and could give no history of his illness. He could be aroused but it was impossible to keep him awake long enough to get a connected story.

Physical examination.—The patient was well nourished and well developed and presented no rash. The temperature was 99° F. on admission and the pulse and respiration were normal. The man could not elevate the upper lids to any extent and endeavored to assist the effort with the frontal muscles. The pupils were dilated but reacted well to light and in convergence. An exact idea of the movements of the eyeballs could not be determined. The neck was flaccid and a similar condition was presented in the muscles of the extremities. The deep reflexes were exaggerated without ankle clonus or Babinski, and the abdominal and cremasteric reflexes were present and normal. A pin stuck with moderate force into the skin caused no resentment on the part of the patient. The blood, urine, cerebrospinal fluid and eyegrounds showed nothing abnormal.

Clinical course and outcome.—The man remained lethargic for three days after which he rapidly recovered and became brighter mentally. He told us he had had a cold a few days before his admission into the hospital and had bought a half pint of whiskey from a bootlegger; he drank the entire amount for the relief of his cold and, like one of Bret Harte's characters, "He curled up on the floor, and the subsequent proceedings interested him no more." The patient said that the whiskey had a peculiar odor and taste and burned on the way to the stomach.

COMMENT.

Since Dercum's paper on the value of luminal in epilepsy, that drug has been widely used. Patients, some of them children, have been kept on luminal for months without bad results, so far as toxic results are concerned, the daily dose as a rule being about one grain. Luminal has been little used as a straight hypnotic and it was tried in the first case reported for such an effect. After twenty-five grains of the drug had been given over a period of five days, the patient had headache and diplopia, two of the most important symptoms of epidemic encephalitis, and these symptoms were quickly followed by lethargy which lasted, in a severe degree, for six days and then gradually passed away, the whole picture being accompanied by a marked asthenia. Fever was absent except in the first day of the intoxication. The history of an excessive amount of luminal having been given, it was thought that the patient suffered from poisoning due to that drug and that she did not have epidemic encephalitis which was the diagnosis first considered.

F. J. Farrell (1) has reported two cases of intoxication due to the excessive use of luminal. His first

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case was that of a woman twenty-four years of age, who took five grains on two successive nights. Following this she became dreamy and sleepy; her speech was slurred and words were mispronounced; there was ataxia and inability to stand without support. Dilated pupils and diminished deep reflexes completed the picture which cleared up in twelve hours. His second case was a man, thirty-five years of age, who took fifteen grains of luminal in the course of three hours and four hours later was given three grains of veronal. The following day his speech was unrecognizable, there was marked ataxia, the pupils were dilated, and the knee jerks were absent. After a period of forty-eight hours the condition cleared up.

A. H. Ruggles (2) has reported the case of a woman who took three grains of luminal every night for nine months because of persistent insomnia. A marked incoordination of the arms and legs developed in this patient.

Veronal, which is similar to luminal chemically, may produce symptoms resembling those recited above. Hassin and Wien reported a case of veronal poisoning which simulated epidemic encephalitis.

Because of the frequency with which luminal is

used at present I thought it apropos to record this case of luminal poisoning, which certainly caused a great deal of alarm and apprehension on the part, not only of the patient's family, but also of the physician who prescribed the drug. The second case, that of the man who took the half pint of "bootleg" whiskey, presented clinically a picture which strongly suggested epidemic encephalitis and in fact, until the condition cleared up and he told the real story of his illness, and in the absence of negative findings of all sorts, that was the diagnosis made. The case also seemed to be worthy of report, as not an ordinary case of alcoholic intoxication, but one in which the symptoms were produced by poor whiskey. In both of the cases reported, because of the symptomatology and the prevalence of the disease, the diagnosis first made was epidemic encephalitis. It is, I believe, important and should be generally known that intoxications can simulate epidemic encephalitis, and it is for that reason that these cases are reported.

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2. RUGGLES, A. H.: *Archives of Neurology and Psychiatry*, August, 1921, p. 234.

5000 WALNUT STREET.

Simple Anorectal Fistula Simulating the Tuberculous Variety

A Report of Two Cases Presenting Unusual Features

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Although tuberculous anorectal fistulae have clear cut clinical features which are lacking in the non-tuberculous variety, they may be mistaken for each other in the zone in which one approximates the characters of the other. To put the matter more clearly, the typical tuberculous and the typical non-tuberculous fistulae would scarcely be confounded by any one with average surgical experience: but it happens occasionally that the physician may be called to see a patient suffering from the former disease, either before the full development of the characteristic symptoms, or when improved general conditions have so altered the local picture that it no longer exhibits the distinguishing features upon which we depend to make our diagnosis. On the other hand, in certain cases of nonspecific fistulae of long standing, in which the patient's resistance has been greatly undermined by absorption of toxins, by the stress incidental to a chronic suppuration, or by other factors such as will be brought out in the course of this report, one may meet with simple fistulae which in their later stages come to resemble the specific group, morphologically and clinically, to such a degree as to lead to possible error in diagnosis; this may arise especially in such patients as happen to be subject to frequently recurring colds, suffer from a persistent cough, are afflicted with chronic gastrointestinal catarrh, or present other

symptoms which may be interpreted as confirmatory of tuberculosis. I have recently observed two cases in which a mistaken diagnosis of tuberculous fistulae was made in such circumstances, in which evidence uncovered at operation cleared up the diagnosis and explained the unusual reaction of the tissues. In order to save others from falling into the same error, they are here reported.

CASE I.—I. R., history number 1706, was admitted to the service of the Jewish Memorial Hospital with a history of an abscess about the coccyx, for which he was operated upon in one of the local hospitals three months before in the usual way, and subsequently treated by cleansing of the wound and gauze drainage. The wound failed to close, and he was referred with a complaint of a chronic thin, dirty grey discharge from an opening one cm. below the tip of the coccyx, tenderness about the rectum and lower end of the spine, and inability to attend to his occupation, because of the pain caused by prolonged sitting or standing. He was constipated, suffered from a hacking cough, felt weak, and was steadily losing weight. Physical examination disclosed signs of chronic bronchitis but no lung involvement, good heart and competent kidneys. Below the coccyx there was a rather patent opening at the edges of which several tufts of granulation tissue were visible, surrounded by bluish skin some-

what undermined. This on probing led toward the bone, to an area which upon being pinched up with the fingers from without gave the impression of a rounded mass, possibly a chronic inflammatory deposit, as was thought. Inspection of the parts showed the buttocks to be flattened, the tuberosities prominent, the anus deepened, the ischiorectal fossæ sunken. Proctoscopic and sigmoidoscopic examinations were negative. A diagnosis of tuberculous anorectal fistula was made, and the patient advised to submit to a conservative operation to secure drainage and to go to the country. At operation (gas) when the tract was laid open, a thickened globular mass was discovered between the posterior wall of the rectum, coccyx and lower sacrum, which when broken up with the fingers was found to be a piece of gauze one cm. by five cm., such as is used for drainage. Upon being further questioned later (without being told of the reason), he remembered that at one period of his illness, following the dressings, he felt so well that he thought it unnecessary to return, until a recurrence of the pain made him seek further treatment two weeks later. Following operation the wound healed speedily, the patient's appetite returned, his cough subsided, and he was back at his work in a month.

CASE II.—J. R., history number 1701, male, aged thirty-four, family, previous and present histories negative, was submitted to the service of the Jewish Memorial Hospital with a complaint of pain and tenderness of the inner side of the left buttock, and an annoying discharge from a wound beside the anus. His troubles began eight to ten months before, with a swelling in that region, which after operation subsided for a time, only to recur. His digestion was poor, his bowels constipated, he suffered from a persistent cough and expectoration, and was steadily losing weight. Locally the skin around

the left side of the anal opening was bluish, thick, brawny, raised into folds and perforated by a number of irregular openings from which exuberant granulation protruded, and a few drops of this odorless seropurulent material could be squeezed out. The flattened buttocks, the prominent bony landmarks, and the sunken anus suggested loss of weight. Probing disclosed an undermining of the left ischiorectal fossa for a distance of about five cm. but gave no evidence of perforating the rectum. Sigmoidoscopic examination was negative, physical examination of the lungs, heart and kidneys was also negative. He felt miserable, with pain and annoying discharge, and was unable to work because of weakness and difficulty in sitting down. Although the clinical appearance was not typical, a diagnosis of a probable tuberculous anorectal fistula was made, because of the unusual character of the local lesion and the suspicious general symptoms. At operation a globular mass the size of a large hazel nut was found which contained a ball of hair and a thick semisolid jellylike material—an infected dermoid cyst in an unusual location.

COMMENT.

Infection of the perianal tissue with tuberculosis, whether primary or secondary, leads to a specific reaction which manifests itself in constant, definite and characteristic changes upon which a diagnosis of tuberculosis may be predicated, even before opportunity has been given for a microscopic examination of the tissue. The presence within the tissues of an infected foreign body for a prolonged period, evidently causes a reaction which may result in clinical signs simulating tuberculosis and may lead to error, especially when the patient presents general symptoms suggestive of the disease.

310 WEST EIGHTY-SIXTH STREET.

Local Anesthesia in Dental, Oral, Nose and Throat Surgery

With Particular Reference to Nerve Blocking

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In submitting the subjoined tables and the articles to follow, I realize full well the magnitude of the work I have undertaken. I realize, too, from my own experience, the necessity for a short, concise, yet fairly complete manual of local anesthesia. In my own experience I have had to wade through verbose volumes, page after page, to find some detail which could have been expressed in very few words.

The language used throughout this work will be as simple as possible, so that the freshest freshman and the oldest practitioner may understand. But it is presumed that the reader shall possess a fairly intimate knowledge of anatomy, without which no practitioner can hope to be uniformly successful in the administration of local anesthetics.

Acknowledgment is made to all who have ever

written or talked on the subject of local anesthesia; the references in the following work are so multitudinous that a blanket acknowledgment is made. Any suggestions for the improvement of this work, for future publication, will be gratefully received by the writer and acknowledged with thanks. Succeeding articles will deal with definite technic for each injection mentioned, taking each in the order given in the tables. The purpose is to have the work so arranged that the busy man need but look at the tables to find the general data, and then to look at the succeeding articles to get the specific technic for making proper injections.

EXPLANATORY NOTES.

1. The anesthetic considered throughout this work will be procaine. Procaine is the American name for the older German product which was known by the

name, novocaine. This German novocaine was never made in this country and is not made in this country now. The word novocaine is used today by one of the three manufacturers of procaine as its trade name. The American made product, procaine, is the equal if not the superior of the original foreign made drug.

2. All anesthetic solutions to be used by injection should contain a known proportion of the natural suprarenal extract. The proportion should never be greater than one to 25,000. The ideal proportion is from one to 40,000 to one to 50,000. An anesthetic solution containing suprarenal extract should not be used when it has changed color to any degree.

3. For use as a swab or surface anesthesia use procaine solutions of from ten to twenty per cent., to which suprarenal extract (natural) has been added in the proportion of one to 50,000. Such solutions may be used to pack, swab or spray into the nose or pharynx with impunity and perfect safety.

4. Make all injections slowly. Take at least a minute for the injection of each mil (c. c.) of solution. This works for safety and a better anesthesia of greater area.

5. During the administration of a local anesthetic, the patient should always be semirecumbent if not fully reclining. This position should be maintained for at least five minutes after the injection has been completed, when the patient may be placed in any position desired.

6. All patients approach an operation, no matter how slight it may be, with fear and nervousness. A calm, complacent patient is much easier to work on. Therefore, give, as preliminary medication, either thirty grains of triple bromides, half an hour before operating, or five to ten grains of bromural, a half hour before operating, or one fourth grain morphine fifteen minutes before operating. Any one of these drugs will render the patient quite complacent.

7. Test the susceptibility of the patient for the drug in use in the following manner: Cleanse any selected area. Insert the needle about one fourth inch, and inject, slowly, four or five drops of the solution. Wait and watch for any possible toxic symptoms. If patient has an idiosyncrasy for or is susceptible to the drug, symptoms will develop within thirty seconds. If no symptoms appear, the drug will not be responsible for any after effects. If any disagreeable experiences occur after the thirty second wait, and if no symptoms of toxicity develop in the thirty seconds, the operator is at fault in the technic of his injection or in the technic of his operation.

PREPARATION OF THE SOLUTIONS.

It is absolutely imperative that all solutions injected into the human body shall be as nearly sterile as it is possible to have them. Therefore, diligent care must be exercised in the preparation of those solutions. Only freshly distilled water should be used as the basis of the vehicle in which procaine (or any other anesthetic) shall be ultimately dissolved. Tap water, either raw or boiled, and distilled water from a laundry or drug store, are both contraindicated because of possible contamination.

It is equally imperative, for complete and uniform success, that all solutions to be injected into the

human body shall be isotonic or agreeable to the tissues. It has been found that the salinity or tonicity of the solution may vary from four tenths to one per cent. and still not be an irritant. It has been found also that the so-called Ringer's saline is much more agreeable to the tissues than normal saline. (Ringer's solution contains sodium chloride, fifteen hundredths gram; calcium chloride, twelve thousandths gram; and potassium chloride, six thousandths gram to the ounce.) Under the circumstances it would seem to be better practice to use the Ringer's solution.

Ringer's solution.—Pour a sufficient quantity of distilled water into a casserole to make the required amount of solution for the injection. It is well, in all cases, to make at least two or three mls more of the solution than will be actually necessary for the work in hand. Boil this distilled water freely. After which add to it one Ringer's tablet for each ten mls of water. Dissolve the tablet by further boiling. Do not make a stock solution to be kept for a longer period than a week. After about a week spore formation occurs.

Procaine solution.—To the Ringer's solution thus prepared, add procaine, either in tablet form or as a powder, in the proper quantity to make the desired percentage. Boil again to dissolve the procaine. To the solution resulting add one drop of suprarenal extract to each two or three mls. This will result in a suprarenal proportion of one to 30,000 or one to 45,000. Suprarenal extracts are marketed under various names, such as epinephrine, adrenaline, suprenol, epinine, and suprarenine. All are of U. S. P. strength and are the equivalent of one to 1,000. The first three are products made from the natural glands. The last two are synthetic products. It is my opinion that much better, safer and longer keeping solutions result from the use of the natural extracts than from the synthetic products.

Allow the solution to cool slightly. It is better that the temperature of the solution shall be lower than that of the blood rather than higher. Hot solution scalds and burns thus in a measure isolating itself. A cool solution, on the other hand, when injected slowly into the tissues, is warmed on passing through the small bore of the needle and on its entrance into the tissue so that its temperature is raised to an agreeable point before any damage can result. The ideal temperature, however, is that of the blood.

PREPARATION OF THE TISSUE.

Before allowing the needle to enter the tissue, see that the area about the site of entrance of the needle has been cleansed and rendered as sterile as possible. It must be remembered that the human mouth and its membranes form the dirtiest portion of the anatomy. This condition obtains despite the efforts of the owner of the mouth to keep it clean. It is exceedingly difficult to cleanse the mouth area well. One, therefore, must do the best one can. The following is suggested:

Spray the entire mouth with a pleasing antiseptic solution. Be careful to clean well between the teeth, in the mucous folds, under the tongue, and in the throat. Wipe the area into which the needle shall enter with clean sterile gauze, then paint the

area with a cotton wound applicator which has been saturated with a solution consisting of equal parts of tincture of iodine and alcohol. Keep the mouth open; hold the tongue in its place to prevent contamination.

Insert the needle into the prepared area and proceed with the injection as specified under Note 7. After the waiting period of thirty seconds, proceed with the major injection according to the technic of that injection.

NEEDLES.

There are four varieties of needles on the market: iridioplatinum, tempered gold, nickel or nickeloid, and steel. Each variety has its advantages, but the best all around needle is, probably, the twenty per cent. iridioplatinum one, because it may be rendered sterile by burning or heating in the open flame. Needles of this type should be in heavy gauges only for the greater strength.

Platinum needles, either of the pure metal or alloyed, should never be fastened to their hubs with soft solder. Tin or lead crystallizes and dissolves platinum, thus making the needle weak at the point of attachment.

Needles used for specific injections should be of sufficient length so that when the needles are in their proper places in the tissues, at least one centimetre of their lengths shall be outside of the tissue. Needles usually break at the hubs; if by any chance the long needle breaks, enough of it is exposed to enable the operator to easily grasp the protruding portion and withdraw the needle.

All needles should be of heavy or large gauges for strength. Large needles, when properly used, do not cause any more pain on insertion than smaller sizes.

In the specific technic of the various injections, the proper length and size of the needle to be used are given. This indicates that the length given shall be the full length of the needle proper, and that *all* of the length specified shall be outside of the hub. The lengths specified, in all cases, allow for at least ten mm. of the needle to remain outside of the tissue when the needle shall be in its proper place.

The use of the Schimmel type needle (unless its full exposed length shall be as specified) is to be discouraged. Never, under any circumstances, use a needle on which a so-called guard is soldered. Invariably these needles break distal to the guard, leaving the broken portion of the needle buried in the tissue. These needles are dangerous.

The depth of insertion of a needle into tissue is determined by anatomical landmarks. No specific measurements for the insertion of needles are to be tolerated except only in the tuberosity and posterior infraorbital injections.

If a guide must be used, place a piece of cork or rubber dam on the needle at the desired point. Such a guide does not weaken a needle.

Needles and syringe.—Upon receiving the needles and syringes from the supply house, open the package and place the needles into a sterilizer and boil for twenty minutes. Remove from the sterilizer, dry the needle, especially its lumen, with hot air blown through the needle with a chip blower. Then place the needles in a small porcelain dish and lay

them away in an airtight cabinet; one of the so-called formaldehyde sterilizers will do nicely. Take the syringe apart, place it in the sterilizer, and boil it for twenty minutes. Put it together and lay it, too, in the sterilizing cabinet. When about to use the syringe and needles, place the needles in the sterilizer once more and boil until ready to attach to syringe.

To prepare the syringe, boil some distilled water in a casserole. Let the water cool slightly, then draw some of the boiled distilled water into the syringe and eject it. Repeat this three or four times. After having ejected the water the last time, draw the procain solution into the syringe. Invert the syringe. Expel any air bubbles. Attach the needle and again expel the air bubbles. Then the syringe and needle are ready for use.

Never draw a solution through the needle into the syringe. The syringe and needle may be clean and sterile, but inadvertently the operator may have inserted the needle into the tissue and quite thoughtlessly draw solution into the syringe without sterilizing the needle, thus contaminating the solution for further use.

HOW TO HOLD THE SYRINGE.

No man can do good and efficient work who is in an uncomfortable position. Hence, hold the syringe in a position that is easy and comfortable. The pen grasp may be best for advancing the needle, but it is not the most logical nor the most comfortable position in which to hold the syringe. It is frequently necessary to force a little solution in advance of the needle as it enters the tissue. Such procedure would require frequent changing of the position of the hand, if the pen grasp is used. Frequent changing of position is rather bad practice.

SPECIFIC TECHNIC FOR THE VARIOUS INJECTIONS. THE INFERIOR DENTAL FORAMEN.

Synonyms.—Mandibular; inferior dental; dento-lingual; linguodental; ascending ramus; retromolar; postmolar, inferior; pterygomandibular; inferior maxillary.

Object.—To reach the inferior dental foramen and anesthetize the mandibular and lingual nerves and their branches.

Location.—The inferior dental foramen is located at about the centre of the internal surface of the ascending ramus of the mandible. Its upper continuation forms the mandibular sulcus which is a concave depression just posterior to the linguala. (More detailed anatomy will be found in the chapter devoted to that subject.)

Prepare four mils of one and one half per cent. procain solution. This quantity includes an excess of two mils. To this solution add two drops of suprarenal extract; this gives a proportion of approximately one to 30,000. Select a sterile needle forty-two mm. long, of twenty-one gauge, and equipped with a hub to fit the syringe selected. The syringe best adapted to this injection is either a two c. c. Luer type or a two c. c. Record type. Cleanse the syringe with boiled distilled water. Fill the syringe with solution, invert the syringe so it points

upward, expel air bubbles. Attach needle. Again expel air bubbles. Cleanse the mouth and throat with spray. Locate and prepare site for injection.

Specific technic.—With the tip of the index finger of the left hand, palpate the full length of the external oblique line (the sharp anterior border of the ascending ramus), external to the buccal surfaces of the lower teeth.

Locate the deepest part of the curvature of the line. This point is usually about a centimeter above the occlusal surfaces of the lower teeth and nearly the same distance external to the buccal surfaces of those teeth. (The posterior end of the buccinator muscle frequently passes over this point. Where this muscle feels thickest over the sharp line is usually the point.)

Hold the tip of the finger at this point. The finger should be flatwise to the buccal surfaces of the teeth and to the buccal mucosa. The long axis of the finger should be parallel to the occlusal plane. The finger nail should be toward the median line. Paint the area about the finger nail with the iodine mixture.

With the bevel of the needle toward bone, insert the needle into the tissue at the middle of the tip of the finger nail. Advance the needle into the tissue until it strikes periosteum and bone. The needle now should be in the retromolar fossa, between the external oblique line and the internal oblique line, on the anterior aspect of the ramus. While advancing the needle to this position, the syringe should be held above and parallel to the occlusal plane and external to the buccal surfaces of the lower teeth.

Withdraw the needle slightly to release its point from periosteum. Carry the needle and the syringe toward the median line—feeling with the needle point on the way—just enough so that the point slides over or around the angle or ridge of the internal oblique line. Advance the needle six to seven mm. into the tissue, keeping the needle in contact with bone. This is approximately the site of the lingual nerve. At this point inject slowly one half mil of procain solution. Wait thirty seconds. Watch the patient's color, pulse, and eyes. If all is well, proceed. (This injection at the lingual nerve serves as the test injection described.)

Advance the needle, keeping the side of its point in contact with bone, and keeping the syringe parallel to and above the occlusal plane of the lower teeth. Continue to advance the needle, swinging the body of the syringe toward or beyond the median line, if necessary, to keep its point in contact with bone. Soon the point seems to lose contact with bone—feels like an empty space. It is now passing just beyond the lingual into the mandibular sulcus. Continue to advance the needle slowly, swinging the syringe further toward the opposite side of the mouth (that is, the side away from the needle), if necessary, until the needle point strikes bone full and fair. This is the posterior boundary of the mandibular sulcus.

The needle is now between the ramus and the inferior dental nerve, but slightly beyond the latter.

Withdraw the needle about three mm. Turn the syringe over so the bevel of the needle points away from bone and toward the median line. The point

of the needle is now approximately at the site of the inferior dental nerve.

Here inject slowly one and one half mils of one and one half per cent. procain solution. Take at least one and a half minutes to inject this quantity. The syringe may be kept moving fore and aft during the injection, if desired. Never inject at this site unless the needle point has struck bone and has been withdrawn slightly. This is a definite landmark and must be observed.

When the injection has been completed, withdraw the needle from the tissues. Look to see that the needle is in its proper place on its hub.

Wait for anesthesia. This will appear in from three to twenty minutes, depending upon the excellence of the technic.

Anesthesia is indicated by absence of pain upon pricking the mucous membrane of the gum under the cuspid tooth, on the labial side. This tissue is innervated by the mental branch of the inferior dental nerve. If anesthesia is present at this point, it must be present posterior to that point.

The long buccal nerve, which carries sensation to the buccal mucous membrane, may be involved.

Sensation may be carried by the anastomosing branches from the opposite side sometimes to the cuspid tooth, usually to the lateral but always to the central, on the side injected. This anastomosis involves both the lingual and the labial surfaces. To block this anastomosis make an injection at the opposite inferior dental foramen, at the mental foramen, or in the incisive fossa. (For technic of the last two, see following pages.)

ACCIDENTS.

The internal pterygoid muscle may be pierced and infiltrated, thus producing afterpain.

The temporomandibular ligament or muscle may be pierced and infiltrated; this, too, will cause afterpain.

The needle may be carried too deeply into the tissue with the result that its point will pass into the parotid gland. If injection is made at this point, a temporary paralysis of the facial nerve and its branches will result. Soreness or trismus may follow.

The sphenomandibular ligament may be torn or pierced. Soreness and trismus may result.

The needle may enter a vein in this area; on its removal an extravasation of blood will follow. This may result in soreness, trismus or hematoma. The last usually occurs in the floor of the mouth under the tongue.

The needle may break.

Soreness, fainting, shock or collapse will follow the use of old, discolored, unclean or nonisotonic solutions or solutions containing too great a proportion of suprarenal extract. This applies to all injections.

Infection and dangerous abscesses will follow the use of unclean instruments. This applies to all work. But none of these sequelæ can obtain if the technic has been followed.

REMARKS.

Anesthesia is obtained in all of the lower teeth on the side injected, to and including the lateral, in the body of the mandible to the same location,

in the buccal and labial membrane (except for long buccal interference), in nearly half of the anterior part of the tongue, in the membrane of the floor of the mouth and the mylohyoid muscle and the lingual mucous membrane of the mandible to the lateral tooth.

Anesthesia usually persists for about an hour, but it may last for much longer periods.

INJECTION AT THE MENTAL FORAMEN.

Synonyms.—Mental; mental foramen, etc. (Distinguish between injections in the mental fossa and into the mental foramen.)

Object.—To reach the mental foramen and there anesthetize the mental and incisive branches of the mandibular nerve. This injection usually follows an injection at the inferior dental foramen to block the anastomosing nerves from the opposite side.

Location.—The mental foramen is usually found on the buccal aspect of the mandible about midway between its upper and lower borders, under the

Imperial type. Fill the syringe with solution, after having cleansed it with boiled distilled water; invert so its point is upward, expel air bubbles, attach needle, and again expel air bubbles.

With the index finger, palpate the side of the mandible in the area about one cm. under the bicuspid teeth, locating the foramen. Do this palpating and locating on the outside of the cheek in the area specified. Please note that this foramen is exceedingly difficult to locate, due to the fact that the bone around the foramen is not indented. In most cases the bone feels perfectly flat. Having located the foramen, hold the finger over it on the outside of the cheek. Evert the lip. Cleanse and paint the area into which the needle shall enter with the iodine mixture.

Specific technic.—Enter the needle into the tissue in the deepest part of the mucous fold at a point below the space between the two bicuspid teeth, about five to six mm. away from the gum, in the

TABLE A.—DENTAL STRUCTURES.

Area of operation.	Nerves supplying sensation	To block, inject at	Quantity used—mils	Waiting time in minutes for anesthesis	Area anesthetized
Lower jaw to the lateral tooth	Inferior dental and lingual	Inferior dental foramen Quarter inch under tissue enroute to above	1½ ½	20 5	All teeth, bone and lip as specified Tongue and lingual mucosa
Lower jaw to opposite side of median line	Same as above plus anastomosis	Same as above Use either 1. Mental foramen on opposite side or 2. Incisive foramina on opposite side	1 1	10 5	From mental foramen to all of opposite side From opposite side to site of injection
Lower jaw, both sides...	Both inferior dentals and linguals	Same as 1 and 2 above but on each side	1½ each ½ each	20 5	All teeth, bone and lower lip. Tongue and lingual mucosa (Blocks entire lower jaw)
Upper jaw—Second and third molars	Posterior superior dental (buccal) and anterior palatine (palatal)	Tuberosity and Posterior palatine foramen	1½ ½	5 5	Teeth, process and buccal mucosa to second bicuspid Palate (hard) to first bicuspid
First molar and second and first bicuspids	Posterior superior dental (?) Middle superior dental and anterior palatine	Tuberosity (?) Infraorbital foramen (?) Posterior palatine foramen	1½ 1½ ½	5 10 3	See tuberosity (8) above Teeth, process, upper lip and buccal mucosa to bicuspids Palatine surface to first bicuspid
First bicuspid, cuspid, lateral and part of central	(Injection into the posterior infraorbital area is more certain) Anterior superior dental and nasopalatine and anastomosis from opposite side	Infraorbital foramen Anterior palatine foramen	1½ ½	10 3	Entire side of upper jaw except anastomosis which block by infiltration See infraorbital (8) above Anterior palatine surface
All upper teeth, process and mucosa	Superior maxillary division of the trifacial	By infiltration Posterior infraorbital area on each side	as required 2 to 3 each side	3 20	Area injected Entire upper jaw and posterior part of nose
Note	Long buccal nerve may be involved in posterior part of the mouth, buccally	Half inch posterior to Stenson's duct, in mucous membrane	1	3	Buccal mucosa from bicuspids back

Infiltration injections may be made for all of the above areas except on lower jaw back of the cuspid teeth.

space between the two bicuspid teeth. This foramen, however, is seldom in its usual place. It may be seven to eight mm. in any direction from where it should be.

If for this injection alone, prepare three mils of one and one half per cent. procaine solution. This quantity includes two mils in excess of the amount actually required. To the solution add a drop of suprarenal extract which makes a proportion of one to 45,000.

If this injection follows one made at the inferior dental foramen, use the excess solution prepared for that injection.

Select a sterile needle twenty-five mm. long, of twenty-three gauge, and equipped with a hub to fit the syringe used. The syringe best adapted to this work is either a two c. c. Fischer type or a two c. c.

prepared area. Point the needle and syringe downward and inward, thus forming almost a forty-five degree angle with a vertical median plane when viewed from the front. When seen from the side the needle and syringe should be nearly vertical.

Advance the needle in the direction given, with its bevel toward bone, until its point touches bone. Here deposit a few drops of solution which, when leaving the needle, is felt under the palpating finger.

Now search for the foramen by feeling with the needle point. Remember, the foramen may be three eighths of an inch forward or back of the needle point. When the foramen has been found, insert the needle point into the foramen. Then swing the upper end of the syringe backward so the syringe points toward the symphysis of the mandible (the lower point of the chin). Advance

the needle directly into the foramen. The needle point is now at the site of the exit of the mental branch of the mandibular nerve.

At this point, inject one mil of one and one half per cent. procain solution slowly. Take at least one minute to inject the quantity mentioned.

Frequently it seems impossible to find the foramen. Do not hesitate to search for it. If, however, it cannot be found, inject in the area, as near the periosteum as possible, two mils of the solution. Use this amount only if the foramen is not definitely located.

Withdraw the needle. See that the needle is in its proper place on the hub.

Massage the area, endeavoring to carry the solution toward the foramen.

Anesthesia will appear in from five to ten minutes. Anesthesia is indicated by the absence of pain upon pricking the labial mucous membrane under the central tooth on the side opposite to the injection at the mental foramen, if an injection has been made

dental foramen, on each side, if the operation extends beyond the median line. Or, if the operation involves only the opposite central or lateral tooth, the next following injection may be used. Since this injection usually follows a deeper injection, it is not necessary, in that case, to observe the technic given under note No. 7.

INJECTION AT THE INCISIVE FOSSA.

Synonyms.—Mental fossa; incisive fossa; incisive foramina; inferior labial, etc.

Object.—To reach the incisive fossa and anesthetize the anterior teeth and the labial mucous membrane by diffusion of the solution.

Location.—The incisive fossa is the depression on the anterior aspect of the mandible under the incisor teeth. In this fossa are located numerous small foramina through which the solution may pass into the body of the mandible.

If for this injection alone, prepare three mils of one and one half per cent. procain solution. This quantity includes an excess of two mils. To the

TABLE B.—NOSE AND THROAT.

Area of operation	The nerves supplying sensation	To block, inject at	Quantity used—mils	Waiting time in minutes for anesthesia	Area anesthetized
Maxillary sinus.....	Middle superior and anterior superior dentals, nasopalatine and anterior palatine	Posterior infraorbital area near the superior maxillary division of the trifacial	3	20	Full side of upper jaw and nose except near median line, due to anastomosis of opposite side which may be blocked by infiltration
Nasal septum, or nasal walls complete.....	Same as above and Nasal (nasociliary)	Same as above Anterior ethmoidal foramen or By Killian's punctures above site of operation	3 1½ 1 each puncture	20 10 3	Same as above Anterior part of nose, anterior ethmoidal cells and frontal sinus Area supplied by nerve distal to punctures (for anterior part of nose only)
For adenoids or in posterior nasal or palatine area	Branches from Meckel's ganglion	Meckel's ganglion	3	20	Area supplied by all palatine nerves and branches
Tonsils, soft palate, uvula or pillars, upper part	Middle and posterior palatine nerves The pharyngeal and tonsillar plexuses of the glossopharyngeal	Meckel's ganglion or Accessory posterior palatine foramina Under base of tonsil at both the upper and lower poles to get the plexuses and a branch of lingual	½ 1 each	3 3	Part of pillars and tonsils; uvula; soft palate; hard palate forward to first bicuspid tooth Area supplied by branches of both plexuses above site of injection
Tongue	Lingual (anterior part) Glossopharyngeal (posterior part)	At internal oblique line Infiltrate posterior base of tongue	1 as required	5 indefinite	Anterior part of tongue, lingual gum area and part of tonsil Area infiltrated
Below base of tongue and above vocal cords.....	Superior laryngeal	Greater cornu of hyoid bone	2	15	Base of tongue near epiglottis, entrance to glottis, mucosa of larynx above vocal cords

NOTE.—It is understood that the above represents innervation to the median line only. For operations on both sides, injections must be made on both sides to take care of anastomosis.

at the inferior dental foramen. Otherwise, anesthesia will obtain only to and including the lateral tooth on the side of the mental injection.

Infiltration injections must be made in the lingual mucous membrane if the operation is to involve that area.

ACCIDENTS.

The muscles just underneath the foramen may be entered and infiltrated. Soreness will result.

The vein, accompanying the mental nerve, may be punctured. Echymosis or hematoma may result.

The needle may break.

Soreness, fainting, shock or collapse will follow the use of old, discolored, unclean or nonisotonic solutions. This applies to all injections.

Infection and dangerous abscesses will follow the use of unclean instruments. This applies to all work.

REMARKS.

On the whole this injection is quite unsatisfactory. It is better practice to make injection at the inferior

solution prepared add a drop of suprarenal extract. This gives a proportion of approximately one to 45,000. If this injection follows one made at the inferior dental foramen, use the excess solution prepared for that injection.

Select a sterile needle twenty-five mm. long, twenty-three gauge, and equipped with a hub to fit the syringe used. The syringe best adapted to this injection is a two c. c. Fischer type or a two c. c. Imperial type. Cleanse the syringe with boiled distilled water. Fill syringe with the prepared solution, invert so its point is upward, expel air bubbles, attach needle and again expel air bubbles.

Prepare the site of injection by everting the lower lip. Cleanse and paint area under the incisor and cuspid teeth with iodine mixture.

Technic.—Hold the lip away from the gum. Enter the needle, with its bevel toward bone, into the gum tissue, about six to seven mm. under the cuspid tooth. Hold the syringe so that its point is downward and inward, toward the median line and toward the lower end of the symphysis.

Advance the needle in contact with bone, keeping its point under the periosteum, if possible. Deposit a little solution in front of the needle as it is advanced to render its progress painless.

Continue to advance the needle until its point is near the symphysis. Here inject, slowly, four or five drops of solution, withdraw needle about six mm. and deposit more solution; again withdraw needle six mm., and once more deposit four or five drops of solution.

Withdraw the needle from the tissue. See that the needle is in its proper place in the hub.

Massage the area lightly but firmly.

Wait five to ten minutes for anesthesia. Anesthesia is indicated when no pain is evinced upon pricking the mucous membrane between the teeth above the site of injection.

Infiltration injections must be made in the lingual mucous membrane if that area is involved in the operation.

This is a combination conductive and infiltration injection.

The anesthesia produced involves the adjacent structures, particularly the teeth above which the injection is made.

TO BLOCK THE LINGUAL NERVE.

Observe the same precautions as given above. Use same type needle and same type syringe. Use the excess solution. Paint the lingual mucous membrane under the tooth selected with iodine mixture. Enter the needle into the mucous membrane about four to five mm. below the gum margin of the tooth selected, on the lingual aspect. Advance the needle straight downward into the tissue until its point is opposite the apex of the tooth. Here deposit about one half mil of solution, slowly. Withdraw the needle, continuing to deposit solution as the needle is withdrawn. See that the needle is in its proper place on the hub. Massage the lingual gum area, lightly but firmly. Anesthesia will be obtained within three minutes. Test by pricking the membrane above site of injection.

This injection, when made at the lateral tooth, will block the lingual anastomosis near the median line. If made at both the lateral and bicuspid areas an anesthesia will present between the two points.

If the operation involves the anterior teeth on both sides of the median line, it is better practice to make injections at both inferior dental foramina.

2105 SEVENTH AVENUE.

Hepatic Fever Due to Gumma of the Liver

By G. A. FRIEDMAN, M. D.,
New York.

The rarity of hepatic fever of syphilitic origin and the good results following specific treatment prompts the writer to report the following case which came under his observation. The literature on this subject is rather meagre. Rolleston (1) writes that occasionally irregular fever may occur in gummatous diseases of the liver and perhaps may be explained as being due to secondary infection. The fever may suggest hepatic suppuration, malaria, latent tuberculosis, or even typhoid fever.

CASE I.—W. S. L., female, aged fifty-six, single, domestic, was admitted to my service at the Beth David Hospital, January 18, 1920, with a diagnosis of right lower lobar pneumonia. Her chief complaints on admission were persistent cough, pain in the right side of the chest, great weakness, and fever.

Family history.—Father died at fifty from an unknown cause, her mother died at the age of forty-

nine. There was no history of tuberculosis, cancer, diabetes or rheumatism in the family.

Past history.—The patient had had malaria in 1914; was under treatment with quinine for six months. Never had had any other diseases and no operations. Her menstrual periods were always regular; menopause at the age of fifty. Her appetite was fair, bowels regular, sleep normal, habits good. She denied venereal diseases by name and symptoms.

Present history.—Six days prior to admission patient began to cough and had difficulty in breathing. She continued about her work, taking fifteen to twenty grains of aspirin daily for seven days. During the entire period her appetite was poor and she had a feeling of faintness underneath the sternum. One day before admission her cough became more annoying; she began to have paroxysms of chills, with high fever followed by



FIG. 1.—Radiograph showing large area of increased density of upper portion of right lobe of liver.

sweats; also pains in the right side of the chest and in the back.

PHYSICAL EXAMINATION.

Physical examination showed the patient to be a well nourished woman, febrile, and looked acutely ill. Head and ears were negative. Eyes, pupils reacted sluggishly to light. Tongue was coated. Teeth were in fair condition. Heart was normal in size, systolic murmur at the base. Chest was symmetrical, equal expansion. Right lung showed dullness posteriorly from angle of scapula down to base with bronchovesicular breathing and moist bubbling and crepitating râles. Left lung was negative. Abdomen was enlarged, the liver edge was palpable one hand's breadth below the costal margin, not tender. Spleen and kidneys were not felt. There

There was a large area of increased density of the upper portion of the right lobe of the liver (Fig. 1). Aspiration of the right chest and of the subdiaphragmatic space was negative.

CLINICAL COURSE.

On the evening of admission to the hospital the patient had a chill with a rise in temperature to 106°, followed by a sweating, and a drop to 99°. The same happened on the next day (Fig. 2). The pulse and respiration remained comparatively slow; the respiration was never higher than 32, the pulse was below 96, at times as low as 72. On the fifth day mercurial inunctions (2.0) daily were instituted. On the fourth day after inunctions were started there was a sudden drop of temperature from 104° to 97°. Thereafter, the temperature never rose

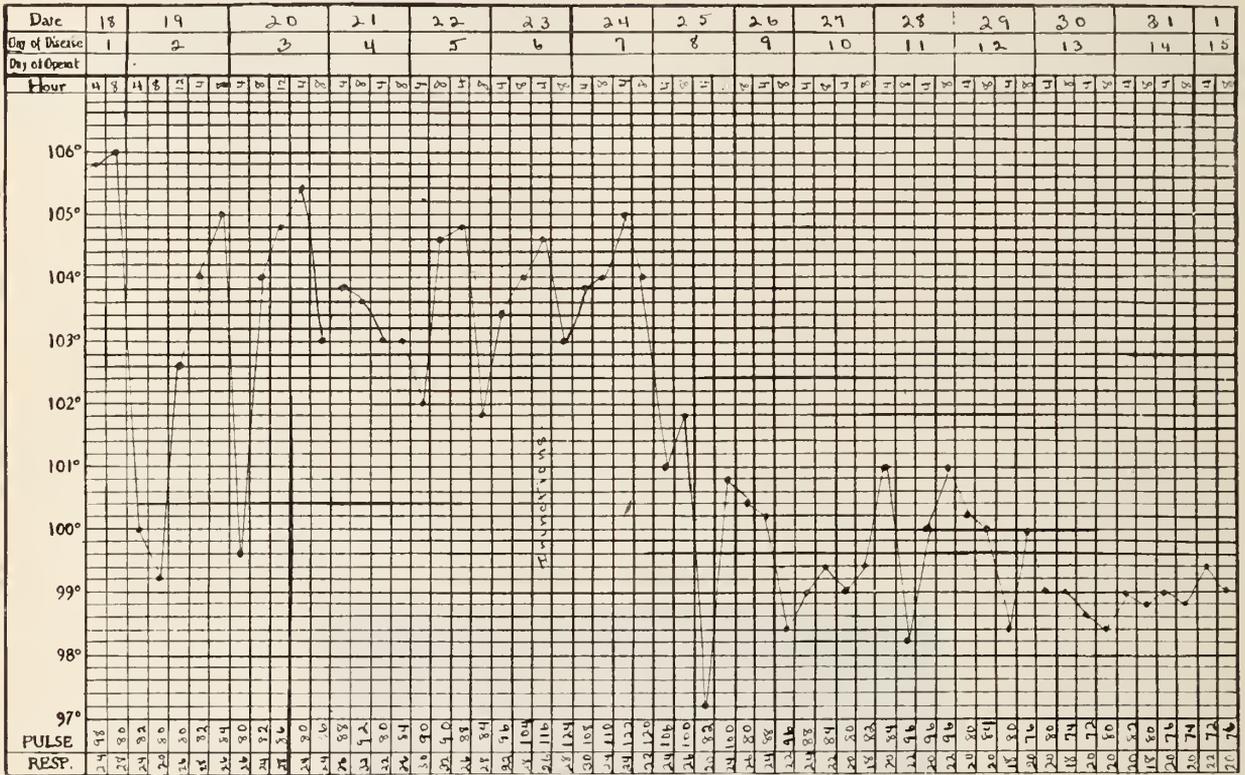


FIG. 2.—Clinical chart of W. S. L.

were no masses. Extremities were negative. Skin and glands were negative.

LABORATORY REPORTS.

The sputum was found to be negative for tubercle bacilli and the urine was negative for albumin, sugar and casts. Blood cultures, taken repeatedly, were negative; malaria parasites negative; white blood cells 15,600; Wassermann four plus.

X RAY EXAMINATION.

A wide aortic arch was revealed by x ray examination. There was an area of diffuse cloudy infiltration occupying the lower and inner half of the right pulmonary field. The clouding was homogeneous. There was a marked elevation of the right diaphragmatic dome. Its upper level was seven centimetres higher than that of the left. (Normally the right is two centimetres higher.)

above 101° and in the course of three or four days dropped down to normal. In all the patient received six mercurial inunctions. She was discharged on March 5, 1920, well. Physical findings were negative on leaving the hospital. The patient returned well in May, 1921.

SUMMARY.

Febrile patient, with enlarged right lobe of liver, demonstrable both on x ray and clinical examination and a positive Wassermann reaction suggested the diagnosis of gumma of the liver. The quick return to normal under treatment confirmed this diagnosis.

REFERENCE.

ROLLESTON, H. D.: *Diseases of the Liver*, 1905, p. 362. W. B. Saunders & Co., Philadelphia, New York, London. 1000 PARK AVENUE.

The Economic Fallacy of Fitting Glasses in Hospitals

By AARON BRAV, M. D.,
Philadelphia,

Ophthalmologist to the Jewish Hospital.

It is an accepted fact that refraction cannot be done in patients under forty years of age without a mydriatic. It has been attempted by many, it is still tried by some, but clinical experience teaches that the young cannot be fitted properly with glasses without this process. In nearly all cases of eyestrain the symptoms can be relieved by the instillation of a few drops of a reliable mydriatic.

In correcting errors of refraction for the relief of eyestrain one must take into consideration the economic aspect of the problem. All mydriatics entail a loss of time to the patient. Atropine sulphate is probably the best cycloplegic, but its effect lasts for two weeks, during which time the patient cannot do any close work. In ninety per cent of the patients, however, refraction may be successfully done with homatropine, the effect of which lasts from twenty-four to thirty-six hours. From the economic point of view homatropine is the preferable drug to use. In fact, most ophthalmic surgeons in their private work use homatropine for refraction. One drop of a one half of one per cent. solution of homatropine instilled into the eye every fifteen minutes for two hours gives excellent results for refractive purposes. While we recognize this economic principle in the choice of mydriatics to be used in our private work, we have so far failed to give it the consideration it merits in hospital service. Most of the hospitals use atropine or duboisine, which practically incapacitates the patient for two weeks and prevents him from doing his daily work. The general procedure in hospital practice can be briefly stated as follows:

The patient calls let us say on Monday for the first time. After a preliminary examination he is given atropine and is directed to instil one drop in each eye three times daily and to return on Wednesday. He is then tested for glasses (first test) and is advised to continue his drops three times daily and to return on Friday for the final test. On Friday, after the final test, he is given a prescription for glasses, is told to stop the drops, and to return with the glasses the following week. He has used the drops for one week and it takes at least another week for the effect of the drops to wear off, which means a loss to the patient of at least two weeks' time. Not rarely it means fully three weeks. One must look upon this as decidedly false economy in the domain of philanthropy. No workman or any other man should be put to such an enormous expense and inconvenience in fitting a pair of glasses. There is a loss to the workman, a loss to his employer, and a loss to the community which not infrequently reaches a large sum.

The following case will illustrate this fallacious and stupid ophthalmic philanthropy.

CASE—A. M. consulted me about five months ago, giving the following history. He had been

out of work for six weeks and had just begun to work a few days previously, but could not work on account of severe headache (he was a tailor). He went to the hospital to seek relief, where he was referred to the eye department and advised to secure glasses. This was on Monday. He was given atropine and instructed to instil a drop in each eye three times daily and to return on Wednesday. He was not told of the effect of atropine and the subsequent enforced two weeks' idleness it would entail. He returned on Wednesday, was tested for glasses, and was advised to continue the drops until Friday and then come back for his final test. On his visit on Friday, for some reason unknown to me, after the second test he was advised to continue his drops and return the following Monday. At this time, the patient being very anxious to return to work, he consulted me on Friday afternoon. I tested him and gave him a prescription for glasses the next day but of course the effect of the atropine lasted another week. The patient lost two weeks' work. On further examination I was informed that this patient, while working only about six months during the year, earned, during his working season, seventy dollars a week. The loss in this case may be stated as follows: Loss in wages one hundred and forty dollars, loss to employer thirty-five dollars, for oculist's service fifteen dollars, a total of one hundred and ninety dollars.

The present system of testing workmen for glasses in our hospitals must be considered unsatisfactory from the economic point of view. It gives rise to two weeks enforced idleness and a general reduction in the product of labor. It means a loss to the workmen, a loss to the employer, and a loss to the community. There is something wrong with the ophthalmic departments of our hospitals, there is something decidedly wrong with the social service departments of our hospitals. I am mindful of the difficulties that confront the oculist when dealing with these patients, and I am at present trying to find a solution for the problem, but we must learn how to minimize the evil and prevent this waste. At present the interests of the community would suggest that no workman should be tested for glasses in a hospital while he is at work. He should be treated for diseases of the eye or have refraction done when he is out of work, but he should not be tested for glasses while he is engaged in some labor that he will not be able to perform while he is under the influence of a mydriatic. It should be the duty of the social worker to inform any workman who calls for the relief of eyestrain that it is to his interest to be tested privately by an oculist, that this can be done without loss of time to himself and his employer, or at most with the loss of half a day, and with better results.

917 SPRUCE STREET.

Editorial Articles

THE SANITARY AWAKENING OF VENEZUELA.

For years Venezuela has had a bad name among demographers. It was generally believed that that republic not only viewed the presence of plague and yellow fever with equanimity, but was not frank with the outside world regarding the presence of these diseases. There can be little doubt that these opinions were incorrect, in a measure at least, and that to a considerable extent they reflected the unfortunate political situation in which that country then found itself. It is believed, however, that the work which Venezuela has been doing for the past two and a half years entitles it to consideration and no small degree of faith on the part of the world's sanitarians.

In January, 1919, Dr. L. G. Chacín Itriago returned from Europe to Caracas, the capital of Venezuela, after several years of preparation in the fields of hygiene and tropical medicine. He was appointed *director de sanidad nacional*, a position corresponding to that of national health officer. The problem which faced him was enormous. Given a country situated on the equator and having every climate from the tropical to the frigid zone, sparsely populated yet possessing busy seaports and several good sized cities, having a seacoast to be protected against diseases from abroad and great river valleys prolific in malaria, recurrent fever, leishmaniasis and many unclassified diseases, with a civilization over four centuries old yet containing large stretches of territory in which the people still live in the barbarism of the pre-Columbian era, beside such a task the labors of Hercules dwindle into insignificance. Fortunately Dr. Chacín Itriago had the unqualified backing of his government which had been quickened with the spirit of sanitary righteousness and with an annual appropriation of two million bolivars (about three hundred and twenty-five thousand dollars at the present rate of exchange) he went to work.

A good central office was installed in Caracas. This combined both the federal and the municipal (Caracas) health departments and included divisions of vital statistics, popular public health education, housing, school inspection, sanitary engineering, food and dairy inspection, a good bacteriological and chemical laboratory, a vaccine institute, a botanical garden of medicinal plants, and a bureau of infectious diseases. All persons handling or preparing food for public consumption were required to re-

port for physical examination every three months and to possess, under a penalty of heavy fine, an unexpired permit bearing their photograph. A good isolation hospital has been erected on the edge of the city, and there is a very complete central disinfection plant and a well organized street cleaning department. The public water supply has been improved and a water purification plant is in contemplation. A good sewer system is being installed by the Ministry of Public Works. Vaccination against smallpox is being pushed and it is expected that a serological institute will be put into operation before the close of the year.

At La Guayra, the principal port, a sewage system is being installed and a modern quarantine station is in process of construction. A quarantine station is planned for Puerto-Cabello. La Guayra has a municipal health office with a small bacteriological laboratory.

No case of yellow fever has been reported in Venezuela since 1912 and plague has not been found in man or rodents since May, 1919. Rats are being trapped and examined in the laboratories at Caracas and La Guayra. Plans have been drawn for a garbage incinerator at Caracas and laws for the control of the venereal diseases are now being considered by the government. The Red Cross of Venezuela maintains a venereal disease clinic at Caracas.

All of the foregoing indicates that a fair beginning has been made. To be sure the nationwide problems of malaria, uncinariasis, anthrax, tuberculosis and the dysenteries remain to be attacked and an adequate staff of well trained public health officers and sanitary inspectors is as yet lacking. Nevertheless, while Venezuela's health work is just starting, the highly commendable results of the past two and a half years give great hopes for the future.

RETROPERITONEAL TUMORS

The retroperitoneal space is limited above by the diaphragm, inwardly by the spine, below by the innominate line and outwardly by the lateral region of the abdomen. The posterior wall is formed by the posterior abdominal wall—the psoas and quadratus lumborum. The anterior wall is formed by the ascending colon and root of the mesentery on the right, the descending colon on the left.

A large variety of neoplasms have been found in the retroperitoneal space, such as lipomata, chondromata, fibromata, myxomata, myomata, sarcomata,

and cysts. Under the term retroperitoneal tumors, Sacconaghi includes those derived from either the retroperitoneal tissue or from small organs whose clinical individuality is not clear but are present in this space. Among the latter are included lymph nodes, aberrant parts of the suprarenal gland, the remains of Wolff's body—the mesonephros—or the ducts that correspond to it, namely, Wolff's or Müller's duct.

Certain nonmalignant, malignant, and cystic growths described by some writers as perirenal or pararenal should be regarded as retroperitoneal in origin, likewise certain tumors of the fibrous membrane or fatty capsule surrounding the kidney completely. As to the topographical situation of retroperitoneal growths, at the onset of their evolution they are median, but as they develop they tend to lie over to one side or the other; they are never connected with any of the abdominal viscera. According to whether the growth is lateral or median, the colon will surround it or lie in front of it. These tumors are usually fixed and exceptionally are slightly movable, being displaced by the hand.

Their histological classification is as follows: First, malignant neoplasms, generally primary sarcoma, the other malignant tumors being secondary to an abdominal neoplasm or one in the testicle. These neoformations are rare, representing about one in a thousand growths of the same nature. They grow rapidly and their symptomatology depends upon this fact. Metastases are common. They belong more especially to childhood. Second, nonmalignant growths of the retroperitoneal space, consisting of fibromata, myxomata, lipomata and myomata, lipomata being the most common of all. About a hundred cases have been collected in all, including pure lipomata, fibrolipomata or osteolipomata. They are composed of several lobes, but these cannot be made out by palpation, they vary in consistency, occur in adult age, and appear to develop in women more often than in men.

Cases described as lipoma of the mesentery in reality belong to retroperitoneal growth. A very rare type of retroperitoneal malignant growth has been described under the term of ganglion cell neuroma and is derived from the sympathetic nerve. Only ten authentic cases have been recorded.

Echinococcus cysts in the retroperitoneal space have been recorded to the number of six, while other types of cystic growths are rare although not exceptional. The serous and lactigenous cysts are the most common, while hemorrhagic and dermoid cysts are infrequent, with the exception of traumatic perirenal or pararenal hematoma.

It is to be noted that certain juxtarenal tumors

which are really diverticuli of the renal pelvis are found in the retroperitoneal space. Tumors of the retroperitoneal lymph nodes are due to tuberculosis, syphilis, leucemia or pseudoleucemia. Two cases of syphilitic connective tissue neoformation have been recorded, respectively, by Fournier and Loeb. In Fournier's case the patient recovered by specific treatment, while Loeb's patient died from ileus.

Retroperitoneal suppurative processes are derived from the appendix, female organs of generation, the kidney, and from bone. In the latter case Pott's disease or coxalgia is the cause. An infection of the retroperitoneal space may also be derived from the stomach and bile tract or it may be metastatic in origin.

PAST HISTORY.

Do we waste time in getting past histories of cases? Perhaps this depends upon what we try to secure in past histories. Often we attempt to learn only whether the patient has had the common infections, such as measles, diphtheria and scarlet fever. This information is not always easily secured, but of what value is it when we have it? Measles may lead to affections of the chest or the eye, but certainly its effect is limited to the period of recovery from the infection and can hardly be said to be a matter of past history. Besides, does it make the determination of the present condition in the least easier? Scarlatina may lead to ear trouble or kidney disease; but, again, if it does influence the body in this disastrous direction, it will be within a brief time thereafter and neither otitis nor nephritis is more certainly diagnosed for the knowledge. Rheumatism or tonsillitis may be followed by heart disease, but many persons with chronic endocarditis give no history of joint or throat affections, nor does the size of the heart, a murmur or other misbehavior become any more evident if the person has given a history of rheumatism. Even in venereal disease the relation of the patient's past sexual experiences is little to be depended upon and does not modify present conditions.

When it comes to preventive medicine past history of infections is quite another matter and may be made of great use, especially in schools in times of epidemics, in segregating the children who have not had the disease and in keeping special watch over them for signs of onset.

For the diseases, whether of children or of adults, which grow out of bad bodily or mental habits, past history has an undoubted value, indeed a double value, yet it is in these cases that history is least considered. By going carefully over the habits of the patient the present state of affairs stands out

more and more clearly and both patient and practitioner are in possession of data for the beginning of a cure. In adults this self-examination and revelation of faults, from those of feeding to those of thinking, is essential to a return to a normal existence. On the whole, much time is wasted on past history which is of least value, and not enough is spent upon that which is of most use for diagnosis, treatment, and prevention of disease.

PHYSICIAN AUTHORS: DR. THOMAS
DUNN ENGLISH.

Although Dr. Thomas Dunn English is known today almost solely because of his ballad, *Ben Bolt*, he did a vast amount of literary work during a long and busy career. He wrote several novels and plays and hundreds of poems, editorials, scientific treatises, addresses, lectures, pamphlets and campaign documents, and devoted several years of his life to editorial work. He began writing when he was sixteen or seventeen years old for *Paulson's Advertiser* and other Philadelphia papers, and he continued to write almost up to the time of his death at Newark, N. J., on April 1, 1902. *Kallimais*, a poem of nearly six hundred lines, was written in a single day and published without revision. His most successful play, *The Mormons, or Life in Salt Lake City*, was written in three days and nights. *The Logan Grazier*, a poem of more than one hundred lines, and two other poems of nearly the same length were composed by him in three hours.

Notwithstanding that it was *Ben Bolt* which brought him his greatest fame, and will preserve his name in literature if it is to be preserved at all, Dr. English professed dislike for the ballad and called it "one of my early indiscretions." *Ben Bolt* was first published in the *New York Mirror*, then edited by Nathaniel P. Willis, on September 25, 1843, and became popular everywhere. Newspapers throughout the United States, Canada, England, and wherever English was spoken, copied it, and everybody recited and quoted it. As a song it began its career in a Pittsburgh theatre, where Nelson F. Kneass, a young actor, adapted it to a German air and first sang it in a melodrama called *The Battle of Buena Vista*. When George Du Maurier introduced it into his novel, *Trilby*, it took on a new lease of life and after years of half neglect almost became a best seller again.

The novelists have done well by *Ben Bolt*, better than they do by most popular songs. In a novel published in London in 1877 the singing of the ballad is made the incident which brings about the reconciliation of two lovers and a happy ending of the story. The song also is introduced into George

W. Cable's *Dr. Sevier* (1883) when Mary, the heroine, begins to sing it during her evening walk with John Richling and is subsequently overheard by Dr. Sevier singing it as she is busily employed doing the week's washing.

Dr. English was born in Philadelphia on June 19, 1819. The English family came to America in 1683 or 1684 and settled at Mt. Pleasant, N. J. In 1839, when he was twenty, he got his medical degree at the University of Pennsylvania, but after a brief practice began studying law and was admitted to the bar in 1842. Neither of these professions seems to have suited him, for in 1844 he moved to New York and began editing a daily paper. He continued in editorial harness, in New York and elsewhere, until 1859, when he moved to Fort Lee, N. J., and resumed the practice of medicine. He was a national literary figure when he came to New York to be an editor. *Ben Bolt* had been published the previous year and shortly after he wrote *The Gallowsgoers*, a vigorous but coarse invective against capital punishment. Abolition of the death penalty was then being hotly discussed throughout the Northern States. *The Gallowsgoers* was declaimed from every platform and hundreds of thousands of copies of it were distributed throughout the country.

A few months after he came to New York Dr. English began the publication of *The Aristidean*, a literary magazine which lived less than a year. In 1848 he edited a humorous periodical, *John Donkey*, which also failed, and in the same year he wrote, in collaboration with G. G. Foster, a history of the French Revolution of that time. Soon afterward he moved to that part of Virginia which now is West Virginia and continued to reside there, with some intermissions, until 1859, when he moved to Fort Lee. Although he resumed medical practice there, his pen was by no means idle. During his leisure hours, which seem to have been numerous, he continued to contribute extensively to several leading magazines and journals, and he also began to take an active interest in politics. The result of this was that he served in the New Jersey legislature in 1863-4 and also served two terms in Congress (1890 and 1892) from the Sixth New Jersey district. He was seventy-six years old when he ran for Congress the third time, 1894, and was defeated. His last editorial venture, an outgrowth of his political activity, was his purchase in 1865 of *The Old Guard*, a political and literary paper, which soon failed. He continued to reside in Fort Lee until 1879, when he moved to Newark, where his wife died in 1889 and he died in 1902.

Dr. English was not a pugnacious man, but that he was a good fist fighter when necessary was dem-

onstrated when he and Edgar Allan Poe fought in the streets of New York because of a dispute involving a woman. Dr. English knocked Poe down and mauled him severely, then nursed him the following night. In retaliation Poe wrote a scurrilous paper, *Thomas Dunn English*, in his series, *The Literati of New York*, then appearing in *Godey's Lady's Book*. Dr. English replied with even greater heat in the *New Mirror*, as a result of which Poe sued the paper and got \$225 damages.

As a playwright Dr. English is absolutely unknown today, though several of his plays were big successes in their day. In all he wrote twenty plays, all of which were produced in New York. Those which were the most successful subsequently were presented in other cities. They are said to have been marked by sprightly dialogue and diversity of character, but did not contain much novelty or skill in plot construction. His novels are likewise forgotten. They included *Walter Woolfe*, 1844; or *The Power of the S. F.*, *Ambrose Fecit*; or *The Poet and The Printer* (1867), and *Jacob Schuyler's Millions* (1885). He was also a prolific writer of stories for boys. His first book was a volume of poems; published in New York in 1855 but suppressed, for some obscure reason, by the author. Several other volumes of poems, the most popular of which was *The Boys' Book of Battle Lyrics*, descriptive of incidents in American history, came from his pen in later years. The dissatisfaction that exists in some quarters today with *The Star Spangled Banner* existed in English's day and he was one of those who felt that the country needed a more representative national hymn. He wrote two poems intended to take the place of *The Star Spangled Banner*, but neither of them became popular.

PHYSICIAN OR POLITICIAN.

A forensic problem has arisen in the question of compensation for disabilities incurred in the world war. A struggle has arisen as to whether the government which is spending the enormous sum of three hundred and sixty millions a year shall allow the United States Veterans Bureau to be managed by men whose only asset is favor from the party in power or by competent medical men. The Sweet Act, which created the Veterans' Bureau, and which was approved by the President and Congress on August 9, 1921, placed the responsibility of this important work of compensation for those disabled in the war on a single person. The three branches which were united were the insurance, educational, and medical services.

An unfortunate choice was made in the appointment to the responsible office of district manager of

an important territory, New York, New Jersey and Connecticut. Mr. Joseph Walsh, a former plumbing contractor of Albany, was chosen. Another example is the appointment of Captain Haan to the district of Maryland, Virginia, West Virginia and the District of Columbia, a former police patrolman. These selections seem incongruous. It seems as though a more careful selection could have been made. A medical man with some technical knowledge surely could have been found. There are over 150,000 qualified medical men in this country.

This controversy was brought to public notice when Director Forbes came into conflict with Dr. Haven Emerson, his former medical advisor. He branded Dr. Emerson's statements as "false" when the policy of the bureau was criticized. The statements made by Emerson which resulted in his dismissal, as far as could be determined, have been upheld by many men of repute in the medical profession. This is too serious a problem to be handled by attempting to oust competent medical men of good standing and filling the offices with political aspirants. This move of Director Forbes should prove of interest to medical men for over eight thousand are in the bureau in one capacity or another. Much praise should be given Emerson, for his brave effort to bring the bureau to a higher level. More facts on this all important subject would not be amiss.

HEALTH AND WEALTH.

Health may mean wealth, as the popular slogan has it, but neither capital nor labor sees the connection except to the most limited extent. The eyes of both seem so blinded by the flash of anticipated gold that conditions under which the gold can best be secured but are dimly discerned.

In a factory where, on account of the intense heat, the productivity of the men is low, the manager explained that changes were being made by which the temperature would be still further raised. With a malicious chuckle he exclaimed: "Then we'll see how they will stand it!" Although heat and dust and the use of poisons are known by tradition and experience to affect the working power and longevity of the worker, owners of plants still are more active in furnishing electric fans for their houses of worship than in establishing exhaust systems in their factories. On the other hand, the labor unions, though persistent and powerful in securing shorter hours and higher wages, put up patiently with conditions of labor and policy of planning and building without reference to the human machines or of the conditions under which they do their best work.

All wealth is founded upon and made out of health, but that it should not be built up by the destruction of health goes without saying, whether from a humane or a purely business point of view. Wealth makes a sorry return for such destruction of health if it merely builds hospitals and sanitariums or endows organizations for research, when it leaves undone those things which it ought to have done, or does those things which it ought not to have done in its own wealth production.

After all, wealth has to foot the bills, and what it gains by lack of prevention of industrial disease it is obliged to pay out in taxes and in charities for the support of the disabled, to say nothing of the unsuspected financial loss in diminished productivity at its source.

LABOR LEGISLATION.

The indefatigable Bureau of Labor Statistics of the Federal Department of Labor has prepared a compilation (Washington: Government Printing Office, 1921) of labor legislation in all states for the year 1919. This material is valuable to medical men, particularly because it contains a comprehensive survey of legislation along the lines of hygiene and safety as well as hours of labor for women and children, mothers' pensions, and so on. An eight hour law for women was passed in Utah, and the application of the existing eight hour law in California was extended.

Of the laws applying only to child labor, the most far-reaching is the act of Congress levying a tax on the products of the labor of children under fourteen in mills, canneries, workshops, etc., and under sixteen in mines and quarries. The legislatures of Florida and of Hawaii enacted original laws covering mothers' pensions, and new laws were passed in Nebraska and Pennsylvania. Workmen's compensation is treated in a separate bulletin, but accidents and vocational rehabilitation are covered.

Obituary.

JAMES RAYNOR HAYDEN, M. D.,
of New York.

The NEW YORK MEDICAL JOURNAL learns with regret of the untimely death of Dr. James Raynor Hayden which occurred on Monday, October 10th. Dr. Hayden was born in New York in the year 1863 and was graduated from the College of Physicians and Surgeons of Columbia University in 1884 and later was appointed professor of neurology in this institution, succeeding the late Dr. Robert W. Taylor. He was a Fellow of the American Medical Society and the American College of Surgeons; a member of the American Urological Society, the Society of Genitourinary Surgeons, the International Urological Society and the Academy of Medicine, an alumnus of the New York Hospital, and genitourinary surgeon to Bellevue Hospital and St. Joseph's Hospital, Yonkers. He was a member of the Metropolitan and Calumet Clubs.

News Items.

Harvey Lectures.—The first Harvey lecture in the course for 1921-22 will be delivered at the New York Academy of Medicine, Saturday evening, October 22nd, by Dr. C. R. Stockard, professor of anatomy, Cornell University Medical College. His subject will be The Significance of Modification in Body Structure.

Dispensary Service in Venereal Disease Clinics.—Information regarding opportunities for dispensary assistants in the venereal disease clinics of New York, can be obtained from the secretary of the Section on Venereal Diseases of the Associated Outpatient Clinics, Dr. Alexander N. Thomson, 15 West Forty-third Street, New York.

Herter Lectures.—The thirteenth course of Herter lectures was given by Sir Arthur Keith, of the Royal College of Surgeons, England, on October 5th, 6th and 7th, at Johns Hopkins University, his subject being The Differentiation of Modern Races of Mankind in the Light of the Hormone Therapy.

Industrial Relations Conference.—This conference will be held in Harrisburg, Pa., on October 24 to 27, 1921, under the direction of Commissioner C. B. Connelley of the Department of Labor and Industry. A program is being prepared which includes the discussion of such timely topics as industrial cooperation, industrial waste, industrial education, women and children in industry, medical supervision in industry and industrial publicity. Additional information concerning this conference, with a complete program, can be obtained from the Department of Labor and Industry, Harrisburg.

Fourth Biennial Congress of the Far Eastern Association.—The fourth biennial congress of the Far Eastern Association of Tropical Medicine was held in Batavia, Java, August 6th to 13th. Dr. T. de Vogel, the chief health officer of the Netherlands Indies, presided, it being the first international medical congress ever held in the Dutch East Indies. Delegates attended from Japan, the Philippines, Straits Settlements, Federated Malay States, Formosa, India and Australia. General director of the medical services of Malaya, Dr. A. E. Horn, was elected president for the next two years. The next meeting will be held in Singapore.

Railway Surgeons to Meet in New York.—The thirty-first annual meeting of the New York and New England Association of Railway Surgeons will meet in New York on Saturday, October 29th, with headquarters at the Hotel McAlpin. The program includes a symposium on surgery of the stomach and duodenum, among those taking part being Dr. Lewis Gregory Cole, of New York, Dr. Charles H. Mayo, of Rochester, Minn., Dr. John B. Deaver, of Philadelphia, and Dr. Charles H. Peck, of New York. On Friday preceding the meeting Dr. William B. Coley will hold a clinic in the Hospital for Ruptured and Crippled, and there will also be a clinic in the Post-Graduate Hospital. Dr. John F. Black, of White Plains, is president of the association, and Dr. George Chaffee, of Binghamton, is corresponding secretary.

The Health Institute.—An interesting feature of the fiftieth annual meeting of the American Public Health Association, which is to be held in New York during the week of November 8th, will be a Health Institute, constituting a comprehensive course on public health matters. This institute is open to all public health workers whether members of the American Public Health Association or not. An interesting program has been arranged and full particulars can be obtained from Dr. Donald B. Armstrong, 370 Seventh Avenue, New York.

Minnesota State Medical Association.—Dr. James Frank Corbett, of Minneapolis, was elected president of this association at the fifty-third annual meeting held in Duluth, August 26th to 28th, under the presidency of Dr. Charles Eugene Riggs, of St. Paul. Other officers were elected as follows: Dr. Samuel H. Boyer, of Duluth, first vice-president (reelected); Dr. Charles E. Ide, of Brainerd, second vice-president; Dr. Thomas Williams, of Lake Crystal, third vice-president; Dr. Carl B. Drake, of St. Paul, secretary; Dr. Frederick L. Beckley, of St. Paul, treasurer.

Economic Loss from Industrial Accidents.—At the annual convention of the International Association of Industrial Accident Boards, held in Chicago on Tuesday, September 20th, Sidney J. Williams, secretary of the National Safety Council, stated that the economic loss caused by industrial accidents amounted to about \$1,000,000,000. The wage loss approximated \$853,000,000, he said, and other costs, including surgical, hospital and administrative expense in connection with compensable accidents, added \$161,000,000 to the bill.

Meeting of the Utah State Medical Association.—The twenty-seventh annual meeting of this association was held September 13th and 14th, at Salt Lake City, under the presidency of Dr. Robert R. Hampton. The following officers were elected for the ensuing year: President, Dr. Augustus C. Behle, of Salt Lake City; first vice-president, Dr. Frank K. Bartlett, of Ogden; second vice-president, Dr. George H. Hyde, of Provo; third vice-president, Dr. Lawrence C. Snow, of Park City; secretary, Dr. William L. Rich, and treasurer, Dr. Frederick L. Peterson, of Salt Lake City.

Personal.—Dr. Isaac W. Brewer, former city health officer of Watertown, N. Y., has been made superintendent of Pleasant Valley Sanatorium, the Steuben County Tuberculosis Hospital at Bath, N. Y.

Dr. Victor C. Jacobson has been appointed instructor in pathology at the Albany Medical College.

Dr. Harriet A. Rice, a negress, has been awarded the *Reconnaissance française*, a bronze medal, by the French government for her services in French military hospitals during the war.

Dr. William Walter Cort, associate professor of helminthology in the school of hygiene and public health of the Johns Hopkins University, has returned after spending four months studying the hookworm larvæ in Trinidad.

Dr. Marcus A. Newell, formerly of Sheridan, Wyo., announces his association with Dr. Edward Wallace Lee, 616 Madison Avenue, New York.

New Beth Israel Hospital.—Ground was broken on Sunday, October 9th, for the new three million dollar hospital which is to be erected at Sixteenth Street and Livingstone Place, New York. It will be nonsectarian and have accommodations for five hundred patients.

The Alvarenga Prize.—The College of Physicians of Philadelphia announces that the Alvarenga prize for 1921 has been awarded to Dr. John W. Churchman, of New York, for his essay entitled *Selective Bacteriostasis of Gentian Violet*. The next award of this prize will be made on July 14, 1922. For full particulars concerning the conditions under which this prize is awarded address the secretary of the Committee of Award, Dr. John H. Girvin, 19 South Twenty-second Street, Philadelphia.

One Hundred and Fiftieth Anniversary of New York Hospital.—The New York Hospital Society, which received its charter from King George III, will celebrate its one hundred and fiftieth anniversary on October 26th. The society controls the New York Hospital, Bloomingdale Hospital and the Campbell Cottages for convalescent children, White Plains, and is one of the three institutions of New York which trace their origin to colonial days, the others being Trinity Church and Columbia University.

Died.

ASCHMAN.—In Wheeling, W. Va., on Sunday, October 2nd, Dr. Gustave A. Aschman, aged sixty-one years.

BADGER.—In Sayre, Pa., on Tuesday, September 27th, Dr. Samuel W. Badger, of Athens, Pa.

BLACK.—In San Francisco, Cal., on Saturday, September 17th, Dr. James A. Black, aged fifty-two years.

CONKLIN.—In Fishkill, N. Y., on Tuesday, September 27th, Dr. William J. Conklin, aged seventy-five years.

CORY.—In Cleveland, Ohio, on Friday, September 23rd, Dr. Walter Bennett Cory, aged forty-four years.

CROWDER.—In Birmingham, Ala., on Thursday, September 22nd, Dr. Joseph K. Crowder, aged forty-four years.

DAKE.—In Viola, Wis., on Friday, September 16th, Dr. Alfred J. Dake, aged fifty-two years.

DENISON.—In Parsons, Pa., on Sunday, September 18th, Dr. John W. Denison, aged sixty years.

ENSMINGER.—In Crawfordsville, Ind., on Sunday, September 25th, Dr. Samuel L. Ensminger, aged seventy-seven years.

HALEY.—In Fredericktown, Mo., on Tuesday, September 20th, Dr. Oba Haley, aged seventy-five years.

JENKINS.—In Wilmington, Del., on Monday, August 22nd, Dr. J. Horace Jenkins, of Elkton, Md., aged forty-four years.

KNIGHT.—In Philadelphia, Pa., on Wednesday, September 28th, Dr. Rachel Knight, aged forty-three years.

LEON.—In Tucson, Ariz., on Tuesday, September 13th, Dr. Cipriano Hernandez Leon, aged forty-eight years.

MASON.—In Rochester, N. Y., on Monday, September 26th, Dr. Robert H. Mason, aged fifty years.

MOONEY.—In Syracuse, N. Y., on Saturday, October 1st, Dr. Edward L. Mooney, aged sixty-five years.

PRATT.—In Bellefontaine, Ohio, on Sunday, September 18th, Dr. Lester Cross Pratt, aged thirty-eight years.

RANKINE.—In Tappan, N. J., on Monday, September 13th, Dr. Isabelle Mathison Rankine, of Brooklyn, N. Y.

SHIPLEY.—In Seaford, Del., on Saturday, October 1st, Dr. Everett Shipley, aged sixty-six years.

THOMPSON.—In Noblesville, Ind., on Wednesday, September 21st, Dr. Henry Herbert Thompson, aged forty-four years.

WARNER.—In Canandaigua, N. Y., on Tuesday, August 20th, Dr. Franklin Pierce Warner, aged sixty-eight years.

WEAVER.—In Norristown, Pa., on Saturday, October 1st, Dr. Joseph K. Weaver, aged eighty-two years.

LONDON LETTER.

(From our own Correspondent.)

Financial Position of the Royal Hospital of St. Bartholomew—The Thirty-fourth Annual Conference of the Sanitary Inspectors' Association—Death of a Great Surgeon.

LONDON, September 2, 1921.

St. Bartholomew's Hospital is almost the oldest, the second largest, and the richest by far of all the London hospitals. It was once the only institution of its kind in London which approached being self-supporting, but now it is heavily in debt. The treasurer's report for 1920, which has just been issued, is of great interest, as it contains intimate details of income and expenditure, enabling one to gauge the business efficiency of the institution. A comparative statement of the expenditure for 1914 and 1920 shows that the hospital and convalescent home cost practically twice as much to run in 1920 as in 1914. It is true that the balance sheet for the past year shows that the receipts exceeded the expenditure by more than £25,000, but this apparently satisfactory condition was due to two special and nonrecurring receipts, the grant from the National Relief Fund and the absorption into income of the final balance of the Peace Year Commemoration Fund. These two items together amount to more than £75,000. The number of inpatients has increased from 7,729 in 1919 to 8,971 in 1920 and the average duration of stay in hospital has decreased from 25.2 to 24.1 days; 66,604 casualty patients were registered on their first attendance in 1920 as opposed to 62,266 in 1919.

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The thirty-fourth annual conference of the Sanitary Inspectors' Association, opened at Bath on August 31st, was made memorable by a remarkable valedictory address by Sir James Crichton Browne, who resigned as president of the association after twenty years' service. He asserted that he would fail in his duty and be guilty of culpable prudery if he allowed so appropriate an opportunity to pass without pointing out the one sure way of coping with the growing social evil of venereal disease. He entered a strong plea for the adoption of a policy of immediate selfdisinfection, and said that this had hitherto been opposed by ignorance and negligence on the one hand, and ecclesiastical prejudice and short sighted morality on the other. To proclaim a new antidote to a deadly poison was not to encourage people to run the risk of swallowing it. He insisted that the pathology and treatment of venereal disease must be presented in a different manner to medical students and practitioners in the medical schools. We must have laboratories in which pathological and diagnostic work can be carried out. We must have the supervision of contacts and the effective following of all disclosed cases. But, above all, the public must be educated regarding the incidence and dangers of venereal disease, the use of preventive measures, and personal disinfection must be explained. He was convinced that at the present hour that was the best weapon in combating venereal disease. The statement of the Ministry of Health that selfdisinfection was not likely to be effective

was not according to knowledge. Sir Alfred Mond, the new minister, had inherited a mistaken policy on this question, but Sir James, from his knowledge of the Minister, had no doubt that he would soon come to view the matter in its true light.

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"Wash and be clean" might be the motto of the Sanitary Inspectors' Association, and if it assumed the armorial bearings a tub should certainly be one of the quarterings on its shield. The bath, it had been said, had "an uplifting power"; it ministered to selfrespect; and the not uncommon practice of singing or humming in the bath might be taken as a paean of praise to its salutary virtues, but its hygienic significance had been too long lost sight of or belittled in this country among certain classes. That was now, however, being brought into prominence by the housing schemes, which were everywhere under consideration or execution. We used to pride ourselves in this country on being the best washed people in Europe, and in their young medical days students had to go to Berlin or Vienna to study certain skin diseases which were the outcome of dirt, inveterate dirt, but did not exist at home. We were still, he believed, entitled to claim preeminence in personal cleanliness in Europe, but out of Europe we were undoubtedly hard pressed by the United States, in the West, and outrun by Japan in the East. But, whatever our comparative position as regards personal cleanliness might be, we still had a long way to go before we attained to the proper standard in it and recovered from the blight of unwashedness bequeathed to us by the Middle Ages. If we were to preserve and improve the health of the people, and if we were to progress in the prevention of disease, the dwellings of the people, even of the humblest class, must have facilities for baths and bathing, and if baths and bathing were to be undertaken to the extent and with the frequency that was desirable, the water supply of many British towns would have to be amended.

* * *

Extraordinary disparities in the water consumption of towns of Great Britain have been recorded in the past. Thus, London used water at an average of forty gallons a head a day, compared with a consumption in Birmingham of twenty-seven gallons. The explanation of this was, in part at least, that Londoners had great facilities for enjoying a daily bath. Even the lower middle class houses in London's many suburbs were furnished with a bathroom, but in the provinces bathrooms were still the exception rather than the rule in all save the better and more expensive houses. In the future the number of domestic baths would be everywhere greatly multiplied and the consumption of water enormously increased, and, therefore, it was satisfactory to learn that the water contents of the United Kingdom were at length to be subjected to a comprehensive and systematic survey, which had not been precipitated by the recent drought, but the urgency of which that drought had emphasized.

When the slum was abolished tuberculosis would hide its diminished head, but a *sine qua non* of a perfectly wholesome house would, in the future, be an

abundant and handy supply of pure water and a bath. The general introduction of the bath, the most convenient instrument of personal cleanliness and a constant reminder of the obligation to practice it, would also, it may be predicted, be followed by a notable diminution in the prevalence of tuberculous disease, and would also tend to the reduction of infant mortality. No doubt the introduction of a bath into a house was one thing, and the retention of it for its proper purpose and the habitual use of it was quite another, but the poorer people in Great Britain had not yet had the chance, except to a very limited extent, of showing their appreciation of the bath, and he trusted to the gradual percolation of fashion downwards to the discovery of the soothing pleasure of the bath, to the formation of habit, and to a realization of the connection between dirt and disease, to insure that full advantage would soon be taken of this means of health. The steadily increasing patronage of public baths indicated that people were becoming more and more alive to the call of the bath.

Fear had been expressed that the universal installation of baths, with hot water supply in all houses, might ultimately lead to an excessive and sensuous indulgence of the hot bath, causing thermal debility. He did not entertain any apprehension of this kind, for the hot bath pushed to an extreme had had no such consequences in the case of the Japanese. Great numbers of the Japanese took two or three hot baths a day, and nothing surprised them more than the folly of the foreigner who refused to take even one. In time, however, the charm of the Japanese custom overcame foreign prejudice, and European residents in the country abandoned cold baths in favor of hot ones. The Japanese seemed to be largely exempt from the catarrhs and colds which harried us in Great Britain. It might be thought that the baths would unbrace the nerves and invite colds, but this seemed to be true only of the warm and not of the hot bath, which, taken up to a temperature of 110° F. and followed by cold affusion, stimulated and toned up the system.

* * *

Mr. R. C. Maxwell, of the Ministry of Health, touching upon the various aspects of the housing problem, referred to the difficulties facing the government in dealing with the country's unhealthy areas, including complicated acts of parliament which badly needed consolidation. Where local authorities controlled property on such areas he pleaded for the human touch. Authority might provide new houses but until the type of men and women who occupied these houses had been raised the work would be in vain. He made a suggestion "for which he would probably get a wiggling from the Ministry" and that was that the proper officer to manage property, either old or new, was the sanitary inspector, whose duty it was to report defects.

* * *

One session was devoted entirely to a consideration of the housing problem. Sir James Crichton Browne presided. A good deal of criticism was levelled against the Ministry of Health, inspired per-

haps by the fact that Mr. R. C. Maxwell, of the Ministry of Health, occupied a seat next to the president. However, when Councillor Wheatley, of Glasgow, observed that Sir Alfred Mond was a financier rather than a health enthusiast, Sir James defended him warmly, declaring that the Minister of Health had been reared in a scientific atmosphere, and would deal sympathetically with public health questions submitted to him. In a very brief reply to the critics Mr. Maxwell said there was no short cut to a solution of this gigantic social problem. A way out of the difficulty would only be found by the hard work of the individual man, especially that of the Sanitary Inspector.

Councillor Wheatley, of Glasgow, also said that in Glasgow there were thousands of homeless people, night shelters were full, and the heroes who fought in the war begged for room in the police cells. The first essential step to clearing unhealthy areas was the erection of new houses, because at present there was nowhere for the people to go while areas were being cleared. Local authorities should provide healthy conditions for the people, and then leave the public to judge whether it was better to spend money making Mesopotamia fit for investors than in making Britain fit for heroes to live in.

* * *

Colonel Sir Peter Johnston Freyer, K. C. B., late Indian Medical Service, died on September 9th at 27 Harley Street, London, W. Sir Peter Freyer's name will always be associated with the great operation which he devised, that of suprapubic prostatectomy. Before the introduction of this operation, the lot of the victim of this condition was indeed deplorable. The operation was successful in all respects, although there was criticism of it and opposition to it in the early days. But Sir Peter lived all this down and saw his lifework crowned with complete success and his operation practised by surgeons in all parts of the world. He was the eldest son of Samuel Freyer of Selerna, Galway, born in 1852 and educated at Erasmus Smith's College, Galway. He received his professional training at Steevens' Hospital, Dublin, and in Paris and graduated with the degree of B. A. from the Royal University of Ireland in 1872, with first class honors and a gold medal, and also with the degree of M. D., again with first class honors and a gold medal. In 1874 he received the degree of M. Ch. and L. M. In 1875 he obtained the first place in the open competition for the Indian Medical Service. After a period of military employment, his services were lent to the Government of the Northwest Provinces, under which he held in succession the appointment of civil surgeon at Moradabad, Bareilly, Mahabad, Mussoorie, and Benares. He was awarded the Arnot memorial medal for original surgical work in 1904. Since his retirement with the rank of colonel, Freyer practised as a consulting surgeon in London. His professional publications are chiefly concerned with affections of the bladder especially stone. He was surgeon to St. Peter's Hospital, London, and consulting surgeon to Queen Alexandra's Military Hospital and the Eastern Command.

Book Reviews

SURGICAL PRACTICE.

Operative Surgery. By J. SHELTON HORSLEY, M.D., F.A.C.S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. With Six Hundred and Thirteen Original Illustrations. Illustrated by MISS HELEN LORRAINE. St. Louis: C. V. Mosby Company, 1921. Pp. 721.

The author, in this attractive volume, lays particular stress on the preservation of physiological function and the interpretation of the biological processes that follow surgical operations. He has made no attempt to include every surgical operation in this work, but every one that he has described and recommended either has been done by himself or appears to him to be that particular operation best suited to the disease in question. In this respect the work under review is to a great extent a record of his large personal experience.

In a work of such general excellence as this, it is not a simple matter to select any particular subject for praise or criticism. We should prefer to see "tubercular" glands of the neck designated as tuberculous, but this is so common an error among medical writers that it may be classed with the acute appendix and the more recent acute pelvis of other authors.

The text matter is simple in style, but fully descriptive. The illustrations are of unusual beauty and clearness, and in themselves constitute a most valuable feature of the work. They explain the text most clearly, and their legends are explanatory without the necessity of reading the text to see what they are meant to represent. While this volume is not in any sense of the word a cyclopedia of modern surgery, it may be said to serve in the fullest degree, its purpose of presenting the essentials of surgical practice within a reasonable compass. Typographically it is all that can be desired, and both author and publisher are to be congratulated on the result of their efforts.

DREAMS.

Studies in Dreams. By MARY ARNOLD-FORSTER (Mrs. H. O. Arnold-Forster). With a Foreword by MORTON PRINCE, M.D., LL.D., Author of *Nature of Mind and Human Automatism, The Unconscious, The Dissociation of a Personality*, etc. New York: The Macmillan Company, 1921. Pp. xxxv-178.

It would hardly be fair to subject this book to a critical analysis even though it were worthy of it. The only excuse for its being is an effort to cling to worn-out fanciful dogmas, the reason given by the author being that she cannot accept more modern knowledge. Morton Prince apologetically ushers this feeble host of misinformation into the world. All in all, it is a vain effort to combat more progressive psychology and cling to outworn ideas. Purity is the cry. "What do we care for facts. Purity is more important. Of what use is the truth if it cannot be told?" This seems to be the general tenor of the book.

The author throughout the book insists that her dreams are normal dreams and therefore not subject to the laws of interpretation which Freud has

formulated from his findings in the realm of psychopathology. Yet a careful comparison of the author's dreams do not show any appreciable divergence from those of the psychoneurotics. The author continues in a tiresome reiteration that her dreams are better, finer, more wonderful than those of others. Adler would say that we find here revealed most clearly a lust for power as a compensation for a tremendous initial inferiority.

A clearing house for dreams is suggested. It is hoped that only good, cultured, normal dreams will be admitted for tabulation, those of the castrated preferred. Then some magic formulas are given to break bad dreams, a good ritual which should have been added to some of primitive man's implements. In fact, we find similar processes resorted to as far back as the totemic period. In fact, this book would have been far more valuable then than at present. It came into being a bit too late.

PHYSICAL FITNESS.

The Assessment of Physical Fitness by Correlation of Vital Capacity and Certain Measurements of the Body. By GEORGES DREYER, C. B. E., M. A., M. D., Fellow of Lincoln College; Professor of Pathology in the University of Oxford; Corresponding Member of the Royal Danish Academy of Letters and Sciences, in Collaboration with GEORGE FULFORD HANSON, Late Lieutenant, U. S. A. Medical Corps, Air Service. With a Foreword by CHARLES H. MAYO, M. D., Rochester, Minn. New York: Paul B. Hoeber, 1921. Pp. xiv-127.

The late war emphasized the importance of physical fitness, not only to the individual, but also to the nation consisting of individuals. In the examination of draft recruits in the United States, more than one third were found physically incapacitated for military duty, and the average mental capacity was found surprisingly low, as the result of psychiatric tests made by experts. In view of the fact that many, if not most of these mental and physical deficiencies are preventable, it is highly important that steps be taken for their elimination, in order that the race may be saved from ultimate deterioration.

The author, therefore, aims in this book, to supply medical men and others interested in this subject, with a method, new only in the details of its application, whereby physical fitness can be assessed on the basis of a few simple physical measurements, which will be found to be speedy, easily learned and trustworthy. He discards the theory, long in vogue, that there is a definite relationship between age, height and weight, in the normal human body. His method is based on the fact that there is a distinct relationship between the weight of the body, length of the trunk (i. e., the height when sitting) and the circumference of the chest; also on the fact that there is a demonstrable uniformity of their relationship to the vital capacity of the lungs. The book aims to establish standards of normality with respect to the weight and the size of the body in persons who may be considered as being in perfect health. These standards occupy certain relationships to certain functional measurements, such as vital capacity, and

it is this relationship which forms the basis for this work.

One hundred pages of tables, both in the metric system and American standard system, are devoted to this subject. The tables are supplemented by methods of calculation, by which it is possible to work out the physical fitness of any given individual. Three classes are established, for both males and females, this being done because different degrees of vital capacity will be found in persons of apparent good health, and differing in their physical fitness. Thus, an individual living a healthy outdoor life, or compensating for a sedentary life by regular exercise or sport, will have a considerably larger vital capacity than another individual of the same size and weight living an indoor sedentary life. The tables are arranged to allow for these differences when comparing individuals with other persons of the class from which they are drawn.

The volume before us is exceedingly interesting as a contribution to the subject of human eugenics, and amply testifies to the vast amount of labor involved in its study and preparation.

SURGICAL CLINICS.

The Surgical Clinics of North America. Boston Number, June, 1921. Volume 1, Number 3. Published Bimonthly. Philadelphia and New York: W. B. Saunders Company.

Twenty-one surgeons of Boston contribute material to this number of *Surgical Clinics*, and it may be said that they have produced an excellent volume, quite as interesting and useful as any of its predecessors. The outstanding feature probably is the reconstruction clinic of Dr. Cotton, in which forty-one cases of war veterans requiring reconstruction are presented and discussed. In Philip D. Wilson's clinic, the Syme's amputation is thoroughly discussed and beautifully illustrated. The same may be said of the clinic on renal calculus, by J. D. Barney and his associates.

THE PSYCHOLOGY OF RELIGION.

The Religious Consciousness. A Psychological Study. By JAMES BISSETT PRATT, Ph.D., Professor of Philosophy in Williams College. New York: The Macmillan Company, 1920. Pp. viii-486.

One cannot always speak of an academic clarity in the style of a book. It is, however, to be found here. There goes with it a certain directness which arises out of clear thinking as well as clear statement and which continually restimulates the reader's interest in following the author through many interesting chapters. It is not infrequent, at least in the present day, for an academic writer to attempt to catch the popular reader by sudden resort to current catchwords, even the slang of the hour. The result is a garishness which makes its purpose obvious without attaining it. Such is never found in this writing but Pratt has a far happier faculty of talking to the common man in terms so direct that they are perfectly understandable, so simple that they are as the reader's own more dignified language. They do not stoop to him but assume for him a dignified intellectual sobriety in which he likes to read and think.

The only obscurity that sometimes creeps in occurs when the writer seems to be afraid to trust

the lens of investigating psychology too far and half turns to reassure himself at least of certain objective thought positions which he wants to take for granted. Some would commend the book perhaps as a consistent upholding of those convictions which he evidently wants to hold to, his own "attitude toward the Determiner of Destiny" from which the diligent application of science cannot turn him away. Others would regret that a discussion so able, a scientific pursuit so logically pressed, should not have proceeded unswervingly to its own consistent ends. The wavering points where this otherwise straightforward pursuit is crossed by the author's predilections show that he has not quite entered unequivocally into the meaning or the issues of a thoroughly dauntless psychology. Just as one is following him along the path of psychological penetration he lifts his road upon a trestle when psychology pressed just one moment more would have given far surer rock bottom for intellectual progress.

There would not be so much reiteration of this feature of the book were there not so much positive value in its main course. The work gives evidence of its long period of preparation which the author admits. Yet its protraction over this period has left it no back number in thought nor in its attention to the thought of present day contemporaries. Moreover, Pratt is not discussing religion merely as he has read of it in the confessions of others or their theorizing nor with any special emphasis upon his own personal experience except, as we have said, with the too frequent evidence of his general bias. His work has valuable features, because he has come into close contact with the religions of many lands, with their variety of forms. The book, at the same time, is a rich compendium of the thoughts of others who have attempted the psychology of religion, as well as of many gathered personal experiences which have become available for such psychological study. Both the text and the ample and often exceedingly important footnotes reveal this.

Pratt has left the definition of religion free at the start. Nevertheless, for his own practical purpose, in order to collect his work around a workable starting point and in order to set his reader upon a definite path, he chooses a definition of religion which he adopts merely because of such pragmatic value. His definition is this: "Religion is the serious and social attitude of individuals or communities toward the power or powers which they conceive as having ultimate control over their interest and destinies." He admits the arbitrariness and the relative worthlessness of this as of any one other definition of religion and then proceeds to explain it enough to prove its value for his writing here. Religion is subjective and yet it is a reality. Here already begins that disturbing doubleness of statement. For religion is asserted to be also objective. Pratt is not contented to accept its subjective reality as psychic fact but believes it can be such a subjective reality only because it is true also in its object. No one can deny that the use of religion has been subjectively to establish itself upon assumed objective reality. Over and over again the author

here strikes the note of the seeking of human feeling for a safe and sure hand to grip in its faith, safe and sure ground on which to fasten its subjectivity. He talks of the "will to believe" but fails to push the idea to its ultimate implications. He each time gets so near but just misses the final clinch of the fact of the power of subjective desire so to construct its objects that they satisfy the craving with all the appearance of objective reality. But need psychology stop short of proving such objectivity, apparent or real? The writer seems to think that here is the limit of scientific psychology. He holds with more or less definiteness to regions yet far beyond exploration, if not indeed forever out of the reach of the investigations of psychology.

He does not seem to have taken a clear sweeping view into the nature of the unconscious. His comprehension of it is vague. The fact that it may be a very comprehensible region of the mind, a well spring of impulses, precise for definition, obeying laws which can be examined, seems largely to escape him. Therefore, he fails to see how much could be subjectively created of belief and its objects from such a source. He tries to insert an objective God into it rather than to find the possibility of creation of a complete god idea out of it. He talks of split off states as of something most rare, without realizing a phenomenon merely of a continuous ability and custom of the human mind not to be consciously aware at all times or any time of all that it is up to. Later he speaks of this ability to shelve off some belief from the intrusion of reason or recognition by the intellect but fails to see this is but part of the process he has earlier set aside as of dubious frequency and dubious value for psychology in its study of religion.

Yet Pratt clings to the human sources of the emotion and ideation that go to make up religion or any other social attitude. He discusses the accumulation below the threshold of that which is gathered by man throughout the ages, dropped into the subliminal region to reemerge again in consciousness. Only a fuller comprehension, the fuller knowledge of the unconscious material and its processes, which is growing more and more possible, would have made all this for him a much more satisfactory and enlightening region for his psychology of religion. Neither is his account of early racial beginnings altogether satisfactory. His chronology of the first feeling of an "indefinable, impersonal, all pervading power, . . . the determiner of destiny" is at least questionable. So also is his idea of the historical and therefore psychic relation of magic and religion. He is not afraid of sex in the beginnings of religion in the individual but has not carried this far.

As a historical, psychological study his chapters on the various manifestations of religious experiences, his discussions of the cult with its inner and outer force, of prayer and of worship, offer matter of great interest. The difficulty which overburdens the book and confuses the reader really seeking to be guided to a clearer viewpoint of his own in regard to religion as a psychological factor, and its value for life can be summed up in the writer's own personal attitude. This obtrudes itself in spite of

the sequence of thought and argument, in spite of an array of testimony from experience and from scientific thought brought to bear upon the discussions. This overwhelming factor is the writer's overemphasis upon the value of emotion and emotional experience. He forgets to impress upon his readers a fact which the religious devotee is too ready to overlook, that emotion is never useful, it is only confusedly misleading and even actively dangerous, even through religion, unless it is submitted to the guidance of intellect. Its value to the intellect can never be overestimated but it must have that guiding control. Submitted to the utmost capacity of intellect one need never fear that emotional life will not majestically hold its sway. But it will be in that clearer guided fashion which will not need to be bound to antiquated forms of belief or practice, to have that something which Pratt says the religious man has and others do not. He means a certain unified devotion to an ideal which synthesizes the being. Yet modern life at least is proving this possible beyond the confines of his apparent meaning of religion.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

MODERNE BIOLOGIE. In Einer Vortragsreihe Entwickelt. Von HANS MUCII. I. Vortrag über die Unspezifische Immunität. Leipzig: Von Curt Kabitzsch, 1921. Pp. 31.

KRANKHEITEN DES GEHIRNS UND DES VERLANGERTEN MARKS. Von Geh. Med. Rat Prof. Dr. E. MEYER. Mit Fünfteen Teils Farbbigen Abbildungen. Leipzig: George Thieme, 1921. Pp. iv-128.

VALENTINE'S MANUAL OF THE CITY OF NEW YORK, 1917-1918. New Series No. 2. Edited by HENRY COLLINS BROWN. One Hundred and Seven Illustrations. New York: The Old Colony Press. Pp. 448.

KLEINES PRAKTIKUM KOLLOIDCHEMIE. Von Prof. Dr. WOLFGANG OSTWALD, University Leipzig, Mitbearbeitet von PAUL WOLSKI. Mit Fourteen Textfiguren. Zweite Auflage. Dresden und Leipzig: Theodore Steinkopff, 1921. Pp. xii-159.

SOCIAL ASPECTS OF THE TREATMENT OF THE INSANE. Based on a Study of New York Experience. By JACOB A. GOLDBERG, Ph.D. New York: Columbia University and Longmans, Green & Co.; London: P. S. King & Sons, Ltd., 1921. Pp. 247.

TRANSACTIONS OF THE AMERICAN UROLOGICAL ASSOCIATION. Seventeenth Annual Meeting Held in New York, March 23, 24 and 25, 1920. Publication Committee: Dr. John T. Geraghty, Chairman, Dr. H. A. Fowley, and Dr. Leo Buerger. Baltimore: Williams & Wilkins Company, 1921. Pp. vi-353.

SQUINT. ITS CAUSES, PATHOLOGY, AND TREATMENT. By CLAUD WORTH, F.R.C.S., Consulting Surgeon to the Royal London Ophthalmic Hospital (Moorfields); Consulting Ophthalmic Surgeon to Queen Mary's Hospital for the East End. Fifth Edition. Philadelphia: P. Blakiston's Son & Co., 1921. Pp. ix-242.

GRUNDRISSE DER KOLLOIDCHEMIE. Von Dr. WOLFGANG OSTWALD, Privat dozent an der Universität Leipzig. Sechste Auflage, Unveränderter Abdruck der Fünften Auflage. Mit Zahlreichen Textfiguren und Tafeln und Mit Einem Portrait von Thomas Graham. Erste Hälfte. Dresden und Leipzig: Theodore Steinkopff, 1921. Pp. vi-329.

Practical Therapeutics

A NEW FIELD FOR PHARMACOLOGICAL AND THERAPEUTIC RESEARCH.

BY DAVID LOESER, PH. G.,
New York

It is recorded in the transactions of the Royal Society of England (1) by no less an authority than Robert Boyle, the famous chemist and physicist, that the idea of the intravenous injection of medicine was suggested to him in the early months of the year 1657 by Sir Christopher Wren. That Wren was not a physician, but an architect, is probably known to everyone who has ever heard of St. Paul's Cathedral, and it is a curious fact that the first record of such a revolutionary suggestion should have come from one outside the medical profession.

But it was not until the introduction of salvarsan, two hundred and fifty years later, that really serious attention was given to the subject of intravenous medication. Before that time the action of medicinal remedies was generally supposed to be dependent upon their predilection for certain tissues and organs. Practically no studies had been made for the purpose of ascertaining what effect such remedies produced upon the blood and body fluids. The introduction of salvarsan, however, focused attention upon the possibilities of intravenous administration of other drugs, such as the iodides, iron, and the salicylates, and a new viewpoint was developed concerning the process which brings about their characteristic reactions.

It is the purpose of this paper to draw attention to this heretofore neglected but most important field of research, involving not alone the action of drugs, but certain characteristics of vital physiological functions as well. For it has been incontestably demonstrated by the researches regarding infection and immunity that the majority of symptoms are produced by alterations in the blood stream.

HEMOCLASTIC SYMPTOMS.

The extensive researches which have been carried on during the past ten years into the phenomenon of anaphylaxis, the discoveries regarding the sensitization of the animal organism to certain proteins, especially the work of such men as von Pirquet and Vaughan on the causation of anaphylactic shock, have demonstrated that this condition can be artificially produced by various inorganic substances. The results of Vaughan's experiments with split proteins impress one with the importance of the blood stream and body fluids, and the part they play in vital processes.

The introduction of certain proteins into the circulation of men and animals has been followed by general symptoms practically identical in character, whatever the nature of the protein introduced. In the human there is usually a rise in body temperature and the concomitant symptom complex, to which the term fever has been applied. The occurrence of fever in a human individual presupposes, usually,

the presence of some kind of bacterial infection, but Vaughan has demonstrated that by suitable variations in regard to dose and intervals of time which elapse between injections, one can produce at will the temperature curve of a continued, remittent, or intermittent fever. Likewise such symptoms as violent respiratory and cardiovascular disturbances, the engorgement of splanchnic bloodvessels, the production of hemolysis, or loss of coagulability have been identified as the results of protein absorption (2).

It has been demonstrated that the respiratory and chemical interrelation between the cells and plasma of the blood and the vascular system and tissue cells depends upon the colloidal properties of the cells and plasma. It is therefore readily comprehensible that a disturbance of the normal relations between the blood plasma, blood cells, and tissue cells will result in the exhibition of those phenomena designated as symptoms of anaphylactic shock, such as peripheral irritation, lack of coordination, and in severe and fatal cases, partial paralysis and convulsions. Metabolic and catabolic disturbances are inevitably associated with a disturbance of the colloidal state of the blood.

THE BLOOD A TYPICAL COLLOID SOLUTION.

The blood is a typical colloid solution and it was while studying the colloids that attention was directed to the blood's typical reaction to certain electrolytes, enzymes, and other influences. The colloidal state has been defined as that physical condition of matter wherein it consists of at least two parts or phases, one of which is the active substance and the other that in which it is distributed. The first is called the disperse phase, being the active agent and consisting of either solid or liquid particles so small that they remain in suspension for practically any length of time. This type is represented by the whole blood with the suspended red cells. The second phase is either a liquid or an otherwise homogeneous complex material, and has been termed the dispersion medium, the continuous phase. This type is represented by the blood plasma.

Colloids are readily divided into two groups. These groups are quite definitely defined, and are designated by various names, those most commonly used being emulsoid, or fluid particles, and suspensoid, or solid particles. Those under the first head have many of the properties of gelatin or glue. They swell in water, of which they absorb a large quantity, and gradually disperse until they take on many of the characteristics of a solution. The second group contains substances which are much more sensitive to small traces of added material, appearing to consist of very small particles of solid matter.

The viscosity of an emulsoid colloid is controlled by the quantity of the disperse phase; that of a suspensoid, by the dispersion medium or solvent. The characteristics of colloid solutions are due to the minutely subdivided condition of the disperse resulting in great surface exposure. These particles,

though minute, are larger than molecules. By virtue of their large size, compared with molecules, they exert very little osmotic pressure. Osmotic pressure is the pressure which a dissolved salt exerts on the solvent, and is comparable to the pressure exerted by a gas on a container. This property is brought into play physiologically when added salts increase the osmotic pressure in the blood, resulting in imbibition, or increase of water.

Each colloidal particle carries a definite charge of electricity, some colloids being electropositive while others are electronegative. As a general rule, if any given substance is in the colloid state it will have the same electric sign, but it is possible, when prepared by some special method, to produce colloidal formations in which the particles may be charged either positively or negatively. If we rub a piece of glass suspended by a silk thread with a piece of silk, and then approach it with another piece of glass electrified in like manner, mutual repulsion will be the result. But if we replace the second glass fragment by a piece of ebonite which has been rubbed with fur, the first piece of glass will be attracted because it carries an electric charge of the opposing sign. This illustrates the electrification of colloidal particles. The total amount of electricity in the body is not represented by the electric charge, but only the amount over or under that which it carries when compared with a neutral electrical state. Any substance which can conduct an electric current and be thereby decomposed into separate groups of ions, is called an electrolyte.

Molecules have definite charges, invariable in sign and amount. Colloidal particles differ from molecules in that their electric charges vary in sign and amount. Surface ionization accounts for the charge of colloid particles, probably because of the substance adhering to them, usually OH or H. The fact that the particles are similarly charged accounts for the repelling of one by the other and for the Brownian movement. This constant bombardment accounts also for the prevention of precipitation. Ions with opposite charges effect this electric charge and cause change or precipitation.

Density and viscosity increase friction and favor suspension. Suspensoids are more easily affected by electrolytes than emulsoids. Emulsoids added to a suspensoid tend to prevent precipitation. Heat affects emulsoids, "gels" gelatine and agar, liquefying or creating "sols," but cooling they revert to their gel form. Not all are thus reversible, some remaining sols. Albumin acts in the reverse manner, becoming a gel on heating, and being incapable of reversion. Gelatinization is a change of distribution between the disperse and continuous phases. The contracted gel is the continuous, and the more dilute solution the disperse.

Univalent ions, except hydrion and hydroxidion added as an acid or alkali have little effect, but divalent and trivalent ions act more powerfully in the proportion of x , x^2 , and x^3 , respectively. Emulsoid colloids are largely insensitive to univalent ions, but are readily acted on by trivalent ions. Investigation of the precipitate indicates that the action is a physical, not a chemical effect.

In practice we find that univalent ions, as in sodium iodide, for instance, are very well tolerated intravenously, but as we employ the divalent elements, such as calcium and magnesia, powerful reactions are likely to occur. In the trivalent we find the most toxic elements, such as arsenic, and antimony, and iron especially exerts a most powerful influence. Animal tests demonstrate that the crystalloid salts of iron act violently by precipitating the colloids of the plasma. The hemostatic effect prevents uniform injection. By deionizing iron, and thus throwing it into a colloidal state, we can avoid the hemostatic effect. Even in the colloidal state, iron, as $\text{Fe}(\text{OH})_3$, has about the toxicity of arsenic acid, As_2O_5 , approximately eighteen to twenty milligrams to the kilo weight being the minimum lethal dose of both.

This was determined by the intravenous injection of $\text{Fe}(\text{OH})_3$, employing the method suggested by the Public Health Service for organic arsenic compounds. In addition to the effect of H and OH ions in altering the electric charge of the particles, alkalis and acids also increase the amount of water which can be taken up. It is asserted that this imbibition is due to condensation of water in the colloid particles and the filling of the capillary space between the particles. The force employed is enormous, said to equal four hundred atmospheric units.

Proteins are emulsoid colloids, and in solution without electrolytes they are amphoteric, that is, moving from either electric pole. Electrolytes, either acids or alkalis, confer charges on protein particles. Thus the products of protein ionization—amino acids—are both acid and basic. The ionization effected by electrolytes is accompanied by absorption of water, and with this increase other changes in viscosity take place, such as solubility, osmotic pressure, coagulability, surface tension, and the rotation of polarized light.

Substances in colloidal solution behave quite differently from those which are merely in suspension. Thus, coarse suspensions are not affected by electrolytes and they do not usually bear a definite electric charge, whereas colloidal sols—unless protected—are very sensitive to the smallest trace of electrolytes, and readily migrate toward one pole when an electric current is passed through them. It is a mistake to regard them merely as fine suspensions, as the properties of a substance undergo considerable change when it is converted into the sol state. They do not behave precisely the same as either suspension or solutions, but occupy an intermediate position for which the term sol is preferable. It is impossible to say precisely which substances are colloidal and which are not, but for practical purposes it is quite possible to appreciate the difference.

Red blood corpuscles are negative, but can be precipitated by both positive and negative sols. Those which have been soaked in a solution of salts—especially chlorides and sulphates—are made more easily precipitable by sols, especially ferric hydroxide sol. In red corpuscles from the human subject, the hemoglobin—coloring material—is associated with a complex of various substances, some colloidal and others crystalloidal, and with a liquid which is isotonic with a solution of nine parts of

common salt in a thousand parts of water. If the red corpuscles are immersed in a more dilute solution than this they swell, and hemoglobin gradually passes from them to the external solution (hemolysis). The importance of this phenomena—which is characteristic of colloidal gels—will be appreciated when considering the effect of colloidal substances in diseased conditions of the human subject (3).

In the Hofmeister series of anions we find first in order the most powerful precipitant of the series: citrate, tartrate, sulphate, acetate, chloride, nitrate, chlorate, while iodide and thiocyanate do not precipitate even in saturated solution. The addition of thiocyanate to albumin prevents coagulation, even at 100° C. This order of the series occurs when the reaction of the colloid is neutral; when it is faintly acid, the series is reversed.

It is remarkable that sodium citrate, intravenously administered, has been shown by Neuhof to shorten the coagulation time of blood, which is an apparent paradox, the established employment of sodium citrate being to prevent coagulation during blood infusion. This might be explained by reason of the blood in the body being normally alkaline, but becoming slightly acid when withdrawn from the body: the theory of the Hofmeister series being thus rendered applicable. It should be observed that the iodides occupy a position close to the thiocyanates, both agents having been used therapeutically for the purpose of dissolving fibrous tissue. That certain physiological processes are dependent on variation of viscosity, has been well established. It is also well recognized that the viscosity of the blood is variously influenced by muscular exercise, heat, and chemical stimuli. Salivation, lack of water, and perspiration increase its viscosity, but the digestion of fluids as well as increased respiration, lower it.

P. Adam has found that iodides lower the viscosity of the plasma. It should be kept in mind that all these phenomena are closely associated with the ion concentration in the blood. An increase in hydrogen ions is doubtless connected with an increased viscosity of the plasma, although this effect is much less than that which the hydrogen ions effect when producing the swelling of the red corpuscles. We have seen the possibility of agents affecting the relative surface tension of plasma and red corpuscles which may possibly result in hemolysis, or increased rigidity of the red cells. It is plausible to expect that similar changes might also affect the motility and activity of wandering cells. It has been demonstrated that red cells possess electric charges.

We believe that the facts outlined indicate enormous possibilities for the study of the pharmacological action of well known remedies, so that they may come to be employed in therapeutics on a rational and scientific basis.

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Treatment of Dislocation of Shoulder.—M. S. Henderson (*Surgery Gynecology and Obstetrics*, July, 1921) presents the following conclusions for treatment of habitual dislocation of the shoulder: 1. Capsulorrhaphy to strengthen the shoulder gave fifty per cent. cures in the sixteen cases of habitual or recurrent dislocation of the shoulder. Five of the patients (thirty-one and one fourth per cent.) were so decidedly improved that they were more than satisfied with the operation. This percentage of improvement and the percentages of cures gave good results in eighty-one and one fourth per cent. 2. It is probable that muscle pull or possible relaxation of the shoulder capsule above has not been sufficiently considered in the treatment. It is reasonable to suggest, therefore, that the pectoralis major, teres major, and latissimus dorsi be lengthened, and, if thought necessary, the region of the capsule where the supraspinatus and infraspinatus are inserted and the anterior inferior portion of the capsule be reefed.

X Ray Effects.—Murphy, Hussey, and Sturm (*Journal of Experimental Medicine*, March, 1921) subjected small areas of skin in the groin of mice to an erythema dose of x rays. One week later a cancer graft was inoculated intracutaneously into the area and also a similar graft was inoculated in the opposite groin protected from x rays. The graft in the x rayed area showed a low percentage of takes, while the usual high per cent. was obtained in the normal skin. Grafts introduced into the subcutaneous tissues grew equally as well in the x rayed as in the protected area. Microscopically the skin layers a few days after x ray treatment showed marked infiltration with round cells of the lymphoid type, which was not seen deeper than the skin layers. The authors suggest that this local lymphoid reaction caused by the x rays controls the graft made into the skin, and its absence in the deeper tissues would account for the growth of the grafts more deeply implanted.

Arthroplasty by Putti's Method in Ankylosis of the Knee.—Leriche (*Presse médicale*, March 26, 1921) reports a successful case of arthroplasty carried out according to the technic described by Putti. A posterior plaster half gutter splint holding the leg at 20° of flexion is first prepared and extension of four or five kilograms put on. A horseshoe incision and a median vertical incision eight to ten centimetres long are made, laterally, the incisions are carried down to the bone. The quadriceps tendon is isolated and the vastus muscles on either side detached, thus liberating the rectus, tendon and patella. The patellar tendon is then split, Z fashion, and the patella detached and reflected downward. The ankylosis is next resected with special gonges, the articular surfaces adjusted to the proper shape, a large piece of fascia lata detached through a separate incision, and the flap, with its fold at the popliteal space, placed in position, loosely fixed, and carefully adjusted. The patella is then also remodeled and lined with fat or fascia, the tendon and attachments of the vasti muscles restored, the wound closed without drainage, and the limb immobilized with 20° flexion and traction. Active motion is begun on the fifteenth day, and hot water and hot air used

later for edema. If, three months after the operation, 30° flexion is secured, the condition will subsequently continue to improve. The fibrous tissue assumes cartilaginous characteristics at the points of pressure in the joint and a closed cavity containing mucous fluid is developed. The author saw four of Putti's patients, all showing excellent results. One patient, treated seven years before, had a strong knee joint without lateral motion and with flexion exceeding 90°, and could run, jump and walk normally. X ray plates show good joint restitution, with small lateral osteophytes. Putti operates on traumatic, infectious, gonorrhoeal, and rheumatic knee ankyloses where muscular conditions are favorable, but refuses cases of metatuberculous ankylosis.

An Acute Transitory, and Curable Ataxic Form of Tabes Dorsalis.—G. Guillain (*Bulletin de l'Académie de médecine*, June 28, 1921) describes a special clinical type of tabes characterized by abrupt onset of ataxia without motor paralysis. Within a few hours these patients acquire the appearance of chronic ataxia. The acute condition develops in subjects who have previously had a *fruste* and overlooked tabetic disturbance running its course without any disorder of coordination. The condition is also peculiar in that it is temporary and curable within a few weeks, the patient retaining, however, after recovery from ataxia, manifestations of syphilitic involvement of the central nervous system, such as loss of reflexes, Argyll Robertson pupil, and changes in the cerebrospinal fluid. The special clinical type in question is to be differentiated from the acute paraplegia of ataxic subjects, the so-called acute ataxia which resembles disseminated sclerosis, acute cerebellar asynergia, and ataxia of labyrinthine origin. The acute ataxic disturbances are ascribed either to an inflammatory process involving the nerve paths concerned in equilibration or to fixation of toxic products of the spirochete on certain other conducting paths. Overstrain seems to be an adjuvant in syphilitic nervous involvement. The author voted favorable therapeutic effects in these cases from mercury cyanide by intravenous injection, biniodide of mercury by intramuscular injection, and potassium iodide by the mouth. Intravenous neosalvarsan injections are probably attended with certain dangers in such patients and should not be employed:

Low Blood Pressure in Tabes Dorsalis.—Paulian (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, March 17, 1921) states that nearly all tabetics, apart from those with noteworthy aortic lesions, exhibit low blood pressure, the systolic pressure—Pachon instrument—never exceeding 130 millimetres and being usually between 100 and 120, while the diastolic pressure ranges from 60 to 85. Examination during gastric or other crises and during lightning pains showed that the systolic blood pressure is further lowered at these times. Tabetics nearly always suffer from asthenia, also, which is increased during crises and lightning pains. The view also that there is deficiency of adrenalin in the blood in these cases is in harmony with the combination of low blood pressure and asthenia, and is supported also by the effects of

therapeutic adrenalin administration, which overcomes the condition and relieves the pain. Marinesco found that one milligram of adrenalin, injected hypodermically in tabetic gastric crises, nearly always exerted a rapid sedative action, with removal of pain and also complete cessation of nausea and vomiting in a few hours. One of Paulian's patients was awakened each morning about five o'clock by an imperious desire to defecate, but the taking of ten drops of one in one thousandth adrenalin solution by mouth arrested his attacks of enteralgia and enabled him to resume his interrupted slumbers. The hypodermic route is best for general use, however; injection of one mil of the one in one thousandth solution allays and even checks tabetic crises; if the pain recurs, another similar injection may be administered on the same or the following day without disadvantage. Lightning pains are relieved within half an hour by the same measure. At the same time the asthenia passes off and the blood pressure rises. Paulian thinks that the spinal disease in tabes may influence the secretion of the adrenals through the sympathetic communicating fibres; exhaustion of adrenal secretion might then provoke the actual gastric attacks and lightning pains.

Local Anesthesia.—Willard Bartlett (*Surgery, Gynecology and Obstetrics*, July, 1921) from a study of local anesthesia presents the following conclusions: 1. It is definitely understood that ether by the drop method is the anesthetic of choice for major surgery in general, and local anesthesia in some form for minor surgery. But we go much further than this, and attempt to deal with the large number of special considerations, which do not fall into either one of these classes.

2. One must always keep in mind that local anesthesia has definite limits which are not to be transgressed.

3. Increasing experience and better training will result some day in our having to establish indications for general anesthesia rather than for local, as is the common experience today. It will then seem no more reasonable to anesthetize the entire organism for a strictly local operation, than it would at the present time to bind or splint the entire body for an injury to an extremity.

4. Surely no one will advocate the use of local anesthesia to the point of interfering with the smooth and rapid conduct of a surgical procedure.

5. It may be safely stated that the anesthetization should never be larger than the operation; for example, one should not under ordinary circumstances attempt a radical breast operation, or any one of the larger abdominal procedures which involve both sides of the midline, under local anesthesia alone.

6. The operator will have to train himself especially for this work if he expects to be successful in it, although in a busy clinic one associate should have this phase of surgery wholly in his hands.

7. There is a very definite field for the local anesthetist. Such an individual should play a rôle similar to that which is well known in general anesthesia. His services ought to be in demand by the surgeon who makes only an occasional use of these methods, or by one who is not temperamentally suited to the acquirement of them.

Proceedings of Societies

AMERICAN GYNECOLOGICAL SOCIETY.

Forty-sixth Annual Meeting, Held at Swampscott, Mass., June 2, 3 and 4, 1921.

The President, Dr. WALTER WILLIAM CHIPMAN, of Montreal, in the Chair.

(Concluded from page 435.)

Perforating Hemorrhagic (Chocolate) Cysts of the Ovary and Their Relation to Pelvic Adenomatata of Endometrial Type.—Dr. JOHN A. SAMPSON, of Albany, N. Y., offered the following as evidence that perforating hemorrhagic cysts of the ovary were hematoma of endometrial type: 1. These hematoma, as the uterine mucosa, manifested their activity during the menstrual life of the patient. 2. Histologically the epithelial lining of the ovarian hematoma was similar to that of the uterine hematoma, due to the retention of menstrual blood, often present in adenomyoma of the uterus. 3. Periodical hemorrhages occurred in the ovarian hematoma which were similar in gross and histological appearance to that of menstruating endometrium. 4. The chocolate contents of the ovarian hematoma resembled old menstrual blood. 5. In two patients operated upon at the time of the menstrual period, one the day that menstruation was due, and the other the last day of menstruation, the histological changes in the ovarian endometrial tissue corresponded to the phase of the menstrual cycle indicated by the menstrual history of the patient. 6. The fact that material escaping from the ovarian hematoma might give rise to the development of adenoma of the endometrial type in the tissue thus soiled was further proof that these hematoma contained endometrial tissue.

Bacteriology and Pathology of Fallopian Tubes Removed at Operation.—Dr. ARTHUR H. CURTIS, of Chicago, said that this study indicated that gonorrheal infection was responsible for at least three fourths of all inflammatory lesions of the fallopian tubes. Infection with various types of streptococci had been second in frequency. Tuberculosis, exclusive of generalized tuberculous peritonitis, ranked third. Infections with other bacteria, notably those of the colon group, had been less common and less important. With the exception of a few streptococcus infections, bacteria had not been isolated from tubes which failed to show grossly active inflammation. Just as gonorrheal endometritis seldom became chronic, so it appeared that gonorrheal infection of the tubes ran a quickly self-limited course. While it had long been known that gonococci soon disappeared from the tubal mucosa, it was of interest to learn that modern cultural methods failed to yield growth when the entire diseased tube was thoroughly ground and inoculated into culture media, provided two weeks had elapsed since temperature and leucocyte count returned to normal. This test had been performed and repeated with unvarying results. He, therefore, felt warranted in the conclusion that the fallopian tube was not a focus for

chronic gonorrheal infection. Unfortunately this did not exclude the danger of repeated infection from without, or recurrent invasion of bacteria from the chronically infected lower genital tract.

The present study sustained previous experience that the colon bacillus did not cause serious tubal disease. Bacillus coli was particularly frequent in tuboovarian abscess of large size. As a primary cause of salpingitis it appeared to be of little importance. A survey of the pathological conditions encountered in these tubes emphasized that gonorrheal infection primarily involved the tubes, with resultant thickening, nodulation, closure of the fimbriated ends, and pelvic adhesions which were amenable to separation by blunt dissection. In streptococcus infection tubal involvement was usually but a part of the picture. Perisalpingitis was the most frequent type of tubal lesion, although typical salpingitis, notably hydrosalpinx, occurred with moderate frequency. Tuberculosis was likely to be overlooked if routine histological preparations were not made. When limited to the pelvic organs it was difficult to establish a diagnosis from the gross appearance alone. Unusually resistant adhesions suggested tuberculous or streptococcus infection. Somewhat similar operative measures appeared indicated in streptococcus and in tuberculous salpingitis. In both diseases infection was not usually confined to the tubes; in both, viable bacteria were often still present in the tissues and there was danger of chronic postoperative infection of the ovaries.

Torsion of the Uterine Annexa Occurring Before Puberty.—Dr. RICHARD R. SMITH and Dr. WILLIAM J. BUTLER, of Grand Rapids, Mich., summarized as follows: 1. Torsion of ovarian tumors was an uncommon occurrence in childhood, as shown by the fact that only twenty-six cases, including their own, had been reported in the literature since 1900. 2. About fifty per cent. occurred between the ages of eight and ten. 3. Sixty per cent. of them were dermoids. 4. The tumors varied in size from that of an adult ovary to one reaching above the umbilicus. 5. The symptoms were those of an abdominal crisis similar to that of the same accident in adult life, sudden abdominal pain, vomiting, a variable degree of prostration, tenderness, rigidity, distention, temperature, increased pulse rate, and the presence of an abdominal tumor. 6. The diagnosis was usually difficult, probably due to rarity. Appendicitis was often the preoperative diagnosis. 7. The causes were much the same as in adult life. 8. Fourteen cases of what was said to be torsion of normal annexa had been reported to date. 9. Eight of these fourteen cases, or more than half, occurred before the age of twenty; four under twelve, and presumably before puberty. 10. The tube alone might be involved, the tube and ovary together, or the ovary might be essentially the offending organ. 11. A large proportion occurred in close relation to the menstrual period. 12. Three were reported during pregnancy. 13. Some ques-

tion still existed as to whether a normal tube could undergo torsion, but it seemed to be proved that a normal ovary might do so. 14. Factors, such as the length of the mesentery, the size of the ovary, and the length of the tube, must be considered, as well as the histological structure of the organ. 15. Torsion of annexa in hernial sacs (apart from strangulation) is relatively rare. It occurred only in congenital inguinal hernia and usually in the first year of life.

The Disposition of the Uterus Following Salpingectomy Where It Is Desirable to Preserve Menstruation.—Dr. CAREY CULBERTSON, of Chicago, concluded as follows: 1. Ventral fixation of the uterus had objections which rendered it an undesirable procedure in association with removal of both tubes. 2. Round ligament shortening was unsuitable where the tubes had been removed and should be preserved for the simpler uterine displacements where pregnancy was to follow. 3. The reduction of the uterus in size by removal of its entire fundus was a ready method of disposing of the organ after salpingectomy where, particularly in young women, it was desirable to preserve menstruation. Defundation became a logical procedure not only in operating for the cure of infectious processes, but also for simple sterilization, for ectopic pregnancy, ovarian cystomata and like conditions. Its only contraindication from a technical point of view was that of procidentia uteri.

Vulval and Vaginal Cancer.—Dr. HAROLD C. BAILEY and Dr. HALSEY J. BAGG, of New York, stated that until Janeway had instituted the use of imbedded emanation in vulval cancer, the general opinion of gynecologists was that radium had no place in this field, and even recently they had seen a statement to this effect. From a study of the subject extending now for more than three years they must disagree with this opinion, for they knew that the original lesion might be completely eliminated without loss of any considerable amount of normal tissue, without sloughing, and with comparatively little pain.

They believed that the method outlined was an ideal one for destroying the primary lesion. There was a minimum opportunity for spreading the disease, especially if the insertion of the tubes was preceded by an application of heavily filtered radium, which tended to devitalize the tumor cells. Wherever possible, the radium tubes surrounding the lesion were inserted through normal tissue. It might seem at first thought that the cautery could accomplish as much and in a short time. It must be remembered that the two reactions were dissimilar. The embedded radium produced a prolonged, gradual reactive inflammation, which was effective in checking the extension of the disease.

The experience with various doses of embedded unfiltered radium emanation had shown that if the tubes were of five mc. strength, the elimination of the tumor was associated with extensive sloughing and prolonged and serious discomfort; whereas the smaller dose of about five tenths mc. accomplished as much for the removal of the growth, without sloughing, and with little pain. Except in the most minute lesion, it was not possible to arrange the placing of the tubes so that all the cancer cells were

effectively radiated. Filtered radium, further to check the growth of the injured or partly damaged cells, was necessary as an adjunct to the implantation of bare tubes in vulval and vaginal cancers.

The Cure of Cystic Cervical Endometritis by the Aid of Multiple Scarification.—Dr. HENRY T. BYFORD, of Chicago, said that cystic degeneration of the cervix was curable only by a destruction of the degenerated glandular tissue. When it was limited to a small part or parts of the vaginal portion the desideratum was to destroy only the cysts and degenerating glands. Cutting operations and cauterization destroyed too much functioning mucous membrane, while the ordinary local treatment, consisting of puncture of follicles as they developed and the application of the tincture of iodine, was seldom curative. The author employed a modification of this local treatment that made it curative. Instead of using the ordinary lance pointed uterine scarificator only upon cysts as they became apparent, he used a bayonet pointed one and made from fifty to one hundred punctures into the diseased area or areas from once to twice a week, and made an application of iodized phenol strong enough to destroy or cause atrophy of what remained of the epithelial cells in glands that were already seriously damaged by the inflammatory action, but not strong enough as used to destroy functioning glands. The application consisted of one part each of iodine crystals and glycerin and two parts of phenol. A few treatments were made twice weekly, then once weekly until the surface looked and felt normal. After a few months the patient reported for examination and possible treatment of cystic follicles that had not been reached.

AMERICAN GASTROENTEROLOGICAL ASSOCIATION.

*Twenty-third Annual Meeting, Held at Atlantic
City, N. J., May 3 and 4, 1920.*

Dr. FRANKLIN W. WHITE, of Boston, First Vice-President and Acting President, in the Chair.

(Concluded from page 315.)

Diagnosis and Treatment of Choledochitis and Cholecystitis.—Dr. B. B. VINCENT LYON, of Philadelphia, discussed the need of the early diagnosis and treatment of choledochitis and cholecystitis, with further considerations of a new method. He said that the method might be applied to both diagnosis and treatment, and was the most accurate method, so far made practicable, of making the differential diagnosis between the various components of the biliary system. The diagnosis was developed around the direct study of the gross appearance of the bile, the rate and manner of its collection (i. e., velocity of discharge), and especially the careful examination into the cytology, bacteriology and chemistry of each segregated sample of the bile. These diagnostic factors were then used to amplify the information secured from the history and the physical examination and from special examinations, such as the x ray. The method had been effectively and successfully used in the treatment of catarrhal jaundice, choledochitis, chole-

cystitis, biliary stasis, typhoid carriers, empyema and cholelithiasis. It also offered attractive opportunities for more direct clinical investigation and interpretation of the following: 1. What are the cholegogues, and how do they act? Do they increase the liver secretion of bile and the velocity of the discharge? Do they empty the gallbladder? 2. Precursory states and phases of gallstones and infections—i. e., biliary stasis. 3. Parallel studies on pancreatic secretion—velocity of elaboration of ferments and their discharge. 4. Extension of the scope of chemical investigation into the composition and physical properties of bile.

The Skiagraphic Diagnosis of Gallbladder Lesions.—Dr. DUDLEY ROBERTS said that stones of a dilated gallbladder could be demonstrated in almost all cases that could be satisfactorily skiagraphed. Negative diagnosis had a very decided value, if intensely detailed exposures were secured. It would be unfortunate if unsatisfactory and incomplete skiagraphy were allowed to outweigh sound conclusions as to the existence of gallbladder lesions.

Blood Cholesterol in Gastroenterological Cases.—Dr. TRUMAN G. SCHNABEL, of Philadelphia, said that seventy-five blood cholesterol estimations were made in sixty cases of a gastroenterological character, possessing some features pointing to a possible pathology in the biliary system. From the results obtained, his conclusion was that blood cholesterol offered little diagnostic help in gastroenterological cases.

Spontaneous and Operative Cure of Cirrhosis of the Liver.—Dr. DAVID RIESMAN, of Philadelphia, reported three cases, in one of which cure ensued after thirty-six tapplings, and two in which recovery followed after the Talma operation. He said that one should not be discouraged if the result of the Talma operation was not immediately apparent, and if the patient had to be tapped once or twice after the surgical procedure. As the results in one of these cases showed, the outcome might, nevertheless, be satisfactory. If the intervals between the tapplings did not increase, and if the amount withdrawn was approximately the same at each tapping, there was no use in waiting on the chance of such a fortunate outcome as in the case of the first patient. The possibility of recovery merely from tapping alone was so slight, and the action of drugs was so unavailing, that the patient should have the benefit of surgical treatment if the circulation and kidney function rendered the operation justifiable.

Observations on the Behavior of the Normal Pyloric Sphincter in Man.—Dr. C. W. McCLURE and Dr. L. REYNOLDS, of Boston, presented this communication, which was read by Dr. McClure. The data presented on observations on the behavior of the normal pyloric sphincter in man were in the nature of a preliminary report. The latter dealt largely with the question of acid control of the pyloric sphincter in man. The experiments demonstrated that: 1, the quiescent pyloric sphincter was contracted when food was in the stomach; 2, sphincter opened regularly at approach of each antral peristaltic wave; 3, acid poured into duodenum did not cause contraction of sphincter.

SYMPOSIUM ON DISEASES OF THE ESOPHAGUS.

Value of Esophagoscopy in the Diagnosis of Diseases of the Esophagus.—Dr. E. B. FREEMAN, of Baltimore, Md., read this paper, in which he said that, when indicated, esophagoscopy was very valuable in the diagnosis of ulceration and cicatricial stenosis of the esophagus. He wished especially to emphasize its value in the latter condition.

Symptoms and Diagnosis of Cardiospasm.—Dr. FRANK SMITHIES said that it was important to recognize the difference between spasm at the cardia and cardiospasm. In cardiospasm, the lesion was a tonic one, and not a mere functional disturbance. Occupation played a small rôle in its causation. The dysphagia was not commonly painful. There might be cough or dyspnea. The first swallow of food might cause the condition. Liquids seemed to cause more stenosis than solids. It was characteristic of the condition that at every examination resistance was present. There was only one treatment that had been found to be in any way successful, and that was to keep the esophagus free from food and fluid, and to pass an ordinary divulsing bougie, giving the dilatations as indicated. He said they used a water pressure up to fourteen pounds. The mortality was three per cent. The rupture did not always occur with the highest pressure. If associated lesions were present, they seriously limited the prognosis, unless they had been appropriately taken care of. The cardia may remain dilated, permitting of food retention. It is surprising how great a dilatation may persist and yet be unaccompanied by troublesome dysphagia, when the cardiac orifice was patent and there was moderate elasticity of the esophagus itself.

Röntgenology of the Esophagus.—Dr. LEWIS GREGORY COLE, of New York, demonstrated by lantern slides various lesions of the esophagus and the viscera adjoining it. He said that there were four methods of filling the esophagus. The first was the fluoroscopic observation of the bismuth meal as it passed into the esophagus, with the patient in the erect position; second, the sausage casing described by Stewart, tying one end and allowing the patient to swallow it, and then filling the sausage casing with barium; third, that described by Hirsch as working a thick bismuth and barium solution with gum tragacanth, which, he maintained, stuck to the esophagus; and the fourth was what he himself employed, that of giving the patient such a thick paste that he could not swallow it, and letting him keep it in his mouth until he could, and then making the examination rapidly. He thus got a good contour of the esophagus.

The thing that was especially brought to his attention, he said, was the contour of the esophagus as influenced by anatomical structures bordering on it. These organs could be readily recognized in a moderately dilated esophagus. Consequently, in disease there were alterations in size or pathological changes in many of these organs. He believed that we should greatly increase our scope of mediastinal diagnosis by making an esophageal examination in all cases. The x ray examination was valuable in recognizing foreign bodies, spasms, dilatations, and diverticula.

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NEW YORK, WEDNESDAY, OCTOBER 19, 1921.

Miscellany.

Sudden Death and Tuberculosis of the Adrenals.—Cueyx and Ragot (*Presse médicale*, January 21, 1921) report two cases of sudden death in which complete tuberculous degeneration of the adrenals was found. In both cases a systematic examination for insufficiency of these organs had been made a few days before death, with negative results. Both subjects died abruptly, without prodromes or apparent cause in the way of trauma, infection, intoxication, etc. The term sudden death therefore seems appropriate, the term rapid death being better reserved for cases where the fatal issue is preceded by conditions such as collapse, manifestations suggesting acute poisoning.

Present Status of the Luetin Reaction.—Kilduffe and Soller (*Archives of Diagnosis*, April, 1921) state that the luetin reaction is without value and will give misleading results when iodide medication has been used within four weeks preceding or four weeks after the test. The test has its greatest value in the tertiary and hereditary forms of syphilis, in which the Wassermann test is also of great value. It cannot replace the Wassermann test in the diagnosis of syphilis. A negative luetin test is of greater diagnostic value than a positive, and is of greater diagnostic value than a negative Wassermann. Proper interpretation of the reaction requires considerable skill and experience. Definite statements cannot yet be made as to the specificity of the reaction. A negative reaction must be kept under observation, in doubtful cases, for at least three weeks in order to rule out a possible delayed positive. No adequate explanation can be found to account for the delayed appearance of the reaction. The luetin test, properly performed, checked, and controlled, can be looked upon as corroboratory and presumptive evidence of syphilis, but should always be checked by the Wassermann test.

Gallstones.—A. J. Hall (*Lancet*, September 25, 1920) has experienced cases which point to the conclusion that cholelithiasis is a very common disease even in youth, unsuspected because its vague symptoms are attributed to other causes. The author recommends operation in all cases, although recognizing that late in life gallstones are often not troublesome.

The Effect and Maintenance of Intraabdominal Pressure.—J. B. Fitts (*Southern Medical Journal*, October, 1920) maintains that normal intra-abdominal pressure is a necessary physiological entity which can be maintained by the application of physiological principles, while low intraabdominal pressure is a factor in general physical inefficiency, and of importance in disease of the gastrointestinal tract.

Action of Physostigmine on the Output of Epinephrine from the Adrenals.—Stewart and Rogoff (*Journal of Pharmacology and Experimental Therapeutics*, April, 1921) found that after the administration of physostigmine intravenously or subcutaneously in cats the epinephrine output of the adrenals was augmented to as much as ten or fifteen times the initial output. The stage of augmentation is prolonged and is preceded by a transient diminution. No evidence was obtained that after section of the splanchnics and other nerves going to the adrenals, physostigmine can increase the epinephrine output by peripheral action.

Adenomata of the Carotid Gland.—Mont R. Reid (*Bulletin of the Johns Hopkins Hospital*, June, 1920) adds to the literature of carotid body tumors three cases occurring at Johns Hopkins Hospital. He believes that the slowly growing pigmented tumor of the carotid gland should be designated as adenoma or hyperplasia of the carotid body. In the discussion of the subject Reid covers the following points: pathology, diagnosis, function and treatment. He states that in some cases where an operation is imperative on account of the size of the tumor that it may be wiser to do a decompressive operation than to attempt extirpation of the tumor. Then after the tumor dislocates laterally and becomes more superficial its removal will be easier and safer, especially if the artery has been tied at the time of decompression.

Pathological Changes Accompanying Injections of an Active Deposit of Radium Emanation.—Halsey J. Bagg (*Journal of Cancer Research*, January, 1920) states that animals which have been given subcutaneous or intravenous injections of an active deposit of radium emanation show definite pathological changes in the organs of a more or less chronic type. Among those described are fatty degeneration of the liver, granulation degeneration and congestion of the kidneys, and erosion of the renal cells, congestion of the spleen, and replacement of the bone marrow by blood cells. After subcutaneous injection the lungs were comparatively normal, but intravenous injection produced several lesions in the lungs. Apparently the organs receiving the greatest amount of radioactivity were the liver, gastrointestinal tract, kidneys, lungs and spleen.

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The Pathology of Syphilis of the Central Nervous System with a Digest of Serological Reactions*

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The purpose of this paper is to generalize on the pathology of syphilis as it relates to the central nervous system and to digest the relationship of its serological reactions. Syphilis is a specific disease produced by the *treponema pallidum*, first described by Schaudinn and later obtained in pure culture by Noguchi and now accepted as its etiological factor. The disease is characterized clinically by a portal of entry, the chancre, with localized reactions in the adjacent lymph nodes, followed by more generalized reactions making up the so-called secondary phenomena. The lesions following these generalized, more or less acute or subacute, reactions are grouped as the tertiary stage.

The chancre as in every other infection is, in reality, the portal of entrance and the point of invasion of the *treponema* and is associated with the reaction on the part of the individual against this invasion. This reaction is made up, to a certain extent, of blood vascular transudate and exudate, but is principally characterized by a proliferation of the semifixed and wandering group types of cells, the lymphocytes and plasma cells. These cells, it would seem, supply direct combative and immune factors against the *treponema* and are associated in positive chemotropism as are the polymorphonuclears in the case of staphylococcus invasion. The chancre, therefore, is at first an entirely localized reaction which is gradually overcome and secondarily backed up by a similar lymphocytic and wandering plasma cell reaction in the lymph nodes. Even here, in all probability, syphilis may still be said to be a localized reaction. The process is a slow one and for days and possibly weeks does not cause a bacteremia, in the sense of a typhoid infection for example, but is a gradual progression due to the slower migration of the organism. When these natural defenses in the localized infection of the chancre and of the lymph nodes are overcome, the disease then becomes a true bacteremia, extremely

virulent in the sense of insistence and widespread invasion but low in the sense of toxicity.

Confining this discussion to the central nervous system, undoubtedly the brain and spinal cord, during the secondary period, are invaded to a certain extent by the *treponema* and suffer moderate changes. The surroundings for growth, however, are not as favorable as are found in other parts of the body, so that the lesions produced during the secondary part are not as severe and therefore the symptoms are not as marked, as a general rule. The importance of the secondary stage is not lessened through possibilities of invasion by the *treponema*.

Syphilis is not a destructive disease in the sense that tuberculosis is, but is a productive disease. The spirocheta in its reaction stimulates the production of fixed and semifixed types of cells. This results in an overgrowth of fibrous tissue, often in places where it belongs in small amounts normally, but where in excessive amounts decided lesions result, responsible for symptoms. There is apparently no direct intoxication from the presence of the organism but this overproduction of cells and fibrous tissue in positions in which they do not belong, decreases nutritional value and volume to important parenchymatous cells in the particular site involved and a still further degenerative reaction takes place in the latter cells responsible for important groups of symptoms. This is especially true in the central nervous system.

In the later stages of syphilis, there are large localized specific reactions which are known as gummata. These are nothing more than overproductions of fixed cellular reactions with fibrotic changes and secondary gummy like metamorphoses from which the word *gumma* was derived. These reactions in themselves are not necessarily more severe in the production of symptoms than are the generalized fibrous reaction unless they involve either by pressure or direct inclusion important parenchymatous structures. This conclusion is forcibly borne out in the cases in which gummata are more or less cleared up by adequate treatment.

*From the Department of Laboratories and Research Medicine of the Geisinger Memorial Hospital and the State Hospital for the Insane, Danville, Pennsylvania. Read before the Montour County Medical Society, May 20, 1921.

Syphilis as it affects the central nervous system is not uniformly diffused but is characterized by an extremely uneven distribution. This is due to the fact that reactions are specific against the organisms and the organisms themselves select, probably in a hit or miss fashion, various positions. There is a distinct tendency for the involvement of the meninges, especially in the basilar positions. There is a distinct tendency for involvement of small blood-vessel walls, especially small capillaries and in addition a perivascular lymphatic involvement. Anatomically this should give an even distribution but here again the hit or miss selection of location by the treponema makes it more or less uneven. As a result of arterial wall changes the end lesions, hemorrhage, thrombosis, infarction or areas of softening, are frequently present. These have a tendency to repair rather than progress.

The results of treatment in these advanced stages of syphilis are often discouraging and this is due to the nature of the disease. After the invasion of the central nervous system with its productive reactions and its final degenerative results upon the parenchymatous nerve cells, taking into consideration its lessened rejuvenating powers, the explanation of these poor results is apparent.

Syphilis affecting the central nervous system as an organic disease with its train of pathological changes may be responsible in the one case for purely nervous phenomena, as for example the tabetic, or may affect the higher nerve centres producing the psychoses or the paretics. It may be a combination of both, depending entirely upon the degree, the grade and position of the infection. It is true that specific treatment for syphilis does not offer the absolute protection that only a few short years ago seemed likely, but at the present time all efforts should be bent primarily to prophylaxis and secondarily to the early recognition and adequate treatment in the early stages. Once the delicate mechanism of the central nervous system has been invaded, the degree of response is lessened in proportion to the degree of invasion, and the degree of degenerative change, in the highly specialized and almost negatively rejuvenating character of these cells, decreases the possibility of permanent restoration or even repair in this disease.

Just a word on parasyphilis as defined by the neurologists. From the pathological point of view we are forced to take the stand that parasyphilis is a misnomer. There may be certain types of cases which closely resemble syphilis but these cases must be either syphilis or not syphilis. In the light of our present knowledge, it is not fair to assume that there is a disease like syphilis unless a definite etiological factor producing the so-called parasyphilitic changes can be isolated. For example, the relationship of the paratyphoid bacillus to the bacillus typhosus and paratyphoid fever to typhoid fever.

Syphilis is not an hereditary disease in the sense that the treponema pallidum is directly transmitted to the developing ovum. It is, however, a developmentally acquired disease transmitted to the forming fetus by an active syphilis in the mother. This is a very broad statement, I admit, but is a premise requiring further proof and more elucidation than

space permits in this paper. On the other hand, the degenerative taints in the gemmules of a female ovum and in the gemmules of a male spermatozoon are distinctly transmitted to the offspring. As such true syphilis does not develop in the offspring an infection by the treponema followed by a reaction to it, but starts out primarily with lowered grades of cells and groups of cells which never develop to their proper functioning physiological height. Thus a large group of mental cases, imbeciles or defectives while they are not true syphilitics are the products of syphilis from their progenitors.

In the laboratories of the Geisinger Memorial Hospital and the State Hospital, a review of 1,070 blood serological reactions was made, 915 of which were found to be negative and 110 positive. This gives a percentage of 10.28. At first thought this factor is low but when it is considered that these results included the routine admissions, the percentage is still a little lower than is usually reported. On the other hand, it may mean that there is a general reduction in syphilitics as a result of the modern methods of propaganda.

In a review of sixty spinal fluids, forty-two or seventy per cent. were found positive. This factor does not compare with the previous figure in any sense. The spinal fluids were selected from a group, most of which gave syphilitic symptoms clinically. Of the forty-two cases positive in the spinal fluids, thirty-five were definite cases of paresis, four were cases of cerebrospinal syphilis, one was a senile and one an exhaustive infectious psychosis, which probably was also syphilitic. Of the 110 positive blood reactions, forty or thirty-six and three tenths per cent. were definite paretics. The others were equally divided among the various types of psychoses, dementia præcox predominating.

It is interesting to note that in a number of cases of frank positive spinal fluid reactions, the blood reactions were negative. In a few cases of cerebrospinal syphilis, the blood reactions were positive and the spinal fluid reactions negative. This result would seem to indicate that more frequent spinal fluid tests should be made and stresses the point that a negative blood reaction does not necessarily rule out syphilis of the central nervous system.

The results of the serological reactions were based upon a technic using cholesterinized antigen and the antihuman hemolytic system, so that it is believed that the greatest number of possible positives were obtained. Globulin tests and cell counts were made on every spinal fluid and without exception where the serological reaction was positive, the globulin reaction was positive and in most cases the cells were increased. From this small series, the globulin reaction has come to be rather strongly relied upon.

The interpretation of the serological reactions from the blood and spinal fluid associated with the globulin reaction and cell count in cerebrospinal syphilis should not make the diagnosis but should be considered as a supporting link where clinical symptoms are vague; should be considered a confirmatory factor where clinical symptoms are clear cut, and should be considered a serious possibility where clinical symptoms are absolutely negative.

SUMMARY AND CONCLUSION.

Syphilis of the central nervous system can be controlled and by intelligent handling can be almost eliminated. This is possible only by a complete understanding of prophylaxis and by an adequate and faithful treatment in the early stages.

Syphilis of the central nervous system in the later stages, both neurologically and psychologically, is an incurable disease because of the very nature of the pathological changes.

Syphilis is distinctly a productive disease building up the fixed tissue types of cells, increasing the fibrotic changes, increasing the character of the arteriocapillary walls, decreasing their permeability and interfering with the interchange between the

chemical value of the blood and the metabolism of the parenchymatous cells.

Syphilis, by reason of its productive changes, produces generative metamorphoses in smaller or larger groups of parenchymatous cells, which in the case of the central nervous system results in irreparable damage.

Syphilis produces specific reactions in the nature of gummata which are not as important as its more diffuse changes but which are destructive in nature and therefore from the symptomatological viewpoint are in relation to tumor formation.

Serological reactions are to be taken as great aids but are not to be considered the sole reliance upon which a diagnosis may be based.

A Method of Preserving the Antigenic Properties of Gonococcal Proteins in Glycerol*

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Many primitive people attempted to immunize themselves in a crude way, but with methods now recognized as essentially sound. Thus, South African tribes attempted to protect themselves against snake bites by using a mixture of snake venom and gum. Jenner's demonstration in 1798 that immunity to smallpox could be produced by attenuated virus is an example of the first practical use of specific methods in the history of immunology. In 1885, after many experiments on animals, Pasteur made his first inoculations against rabies in man with success, and in 1892 Haffkine developed a method of vaccinating against cholera with the living spirilla attenuated by long culture.

BACTERIAL VACCINES.

Vaccination by the use of bacteria killed by heat or antiseptics was introduced by Kolle in 1896 as an improvement on Haffkine's cholera vaccine. In the same year Wright introduced the use of killed cultures for immunization against typhoid fever, and two years later Shiga applied the procedure to dysentery with moderate success. This method of immunization has also been successfully applied to plague, meningitis, whooping cough, pneumonia, scarlet fever, and other diseases.

All of these procedures were prophylactic, but in 1904 Wright introduced active immunization as a therapeutic measure in many chronic infections. He used cultures of the specific microorganism killed by heat. Largely owing to the advocacy of Wright, killed cultures have acquired an important position in the treatment of many infections which can be definitely associated with a known type of microorganism.

THERAPEUTIC APPLICATION.

The trend of all modern therapy of infectious diseases is toward the elaboration of specific meas-

ures which will directly influence and counteract the infectious agent. The use of bacterial vaccines in the course of an infection is primarily based on the conception that they will stimulate the patient's tissue cells to produce immune bodies in larger quantities than the cells themselves have been able to generate under the stimulus of the infection. On this basis, localized lesions of a subacute or chronic character should be the type of cases most benefitted; and while in general this has proved to be the fact, yet the more acute and general types of infection may also be benefitted by vaccine therapy.

Although the production of specific immunity sufficient to cause the destruction of the invading bacteria has been considered the aim in the use of bacterial vaccines for the treatment of disease, yet there may be another factor which plays an important rôle in producing favorable therapeutic results. We refer to the possibility of the patient being in a condition of hypersensitiveness to the proteins of the infecting organism, as has been pointed out by Walker (1) in cases of bronchial asthma. Under such conditions beneficial results from vaccine therapy may be due partly to desensitization of the patient to the bacterial proteins whereby relief of the intoxicated cells in the infected area is brought about. These cells being thus restored (as indicated by a lessening of the local congestion, thereby permitting a resumption of a more normal blood supply with its protective substances and phagocytes) are enabled again to function in the production of antibodies and in the process of phagocytosis. Certain it is that the prompt relief of symptoms in some cases, following the use of bacterial vaccines, has occurred too soon for any appreciable antibody formation to have taken place. Hence, such beneficial results can hardly be attributed solely to an increased production of immunity in response to the bacterial vaccine injected, but

*Read before the Section in Genitourinary Surgery of the New York Academy of Medicine, May 18, 1921.

rather, in our opinion, are to be explained, partly at least, by desensitization of the patient to the bacterial proteins.

The practical application of saline bacterial vaccines has not been productive of the universally favorable results hoped for when Wright introduced them. Among physicians in this country and abroad who have used bacterial vaccines in the treatment of diseases there is an almost unanimous consensus of opinion that good therapeutic results have been obtained in some diseases. In spite of numerous favorable reports, however, there is a recognized need for a type of product that will give more efficient control of certain diseases than has been obtained with saline vaccines.

EFFECT OF HEAT.

A method of preparing the most efficient type of vaccine has been a problem to which immunologists have devoted years of study and experimentation. Broth cultures which were first used gave way to the less toxic but equally efficient agar cultures, killed by heat and suspended in normal saline solution. The minimum temperature and time of exposure necessary to kill should be used, since experiments have proved that overheating will destroy the antigenic value of the vaccine. Even the minimum temperature (53° C.) may cause protein changes in the bacterial cell which will lower or impair the antigenic properties. Disinfectants such as phenol, cresol, chloroform, ether and many others have been used, but there is no definite evidence that they are superior to minimum heating. They are, however, often added as preservatives and as a means of insuring the sterilization of the cultures of those organisms which are not readily killed by the heat.

AUTOLYSIS.

Laboratory investigations have revealed the fact that many different species of bacteria, when suspended in physiological salt solution, undergo rapid autolysis or selfdigestion with disintegration of the bacterial proteins and consequent loss of the specific immunizing properties. This process of autolysis or selfdigestion is brought about by the enzymes contained within the bacterial cell, and consists of a chemical decomposition in which the native bacterial proteins break up by hydrolytic cleavage into so-called split products of protein digestion.

Moreover, it has been shown that, at certain stages of selfdigestion or autolysis, the products of such decomposition may be highly toxic in nature and cause severe reactions when injected into the human body. Furthermore, the products of autolysis are not effective in the production of specific immunity. These facts may account for the failure of the saline vaccines to at all times produce uniform and efficient immunity, and may also explain some of the severe general reactions which sometimes follow their use.

POTENCY OF SALINE VACCINES.

No definite knowledge is available concerning the length of potency of saline bacterial vaccines. Park (2) advises that the period be limited to possibly six months; Whitmore (3) states that saline suspended bacterial vaccines made from the typhoid

bacillus should not be used after they are over three or four months old; while Huenekens (4) is of the opinion that pertussis vaccine should be employed only if it is less than one week old. Since autolysis has been accepted to be an important factor in causing deterioration of saline vaccines, and since the usual method of killing by heat must alter certain protein constituents of the bacterial cells, it is evident that saline suspended bacterial vaccines cannot represent the full immunizing properties of the bacteria.

OIL VACCINES.

The problem of preserving the specific immunizing properties of the bacteria, with a view of producing a more efficient product than the saline bacterial vaccine, led Le Moignic and Pinoy (5) to substitute oils for the physiological salt solution previously used in making bacterial vaccines. Considerable hope was entertained for a time that oil was the solution of the problem. However, certain difficulties were encountered which caused the abandonment of the product; and no license has been granted by the United States Government for its manufacture. Hence, the problem was still unsolved of preparing bacterial vaccines in a manner that would insure the immunizing properties of the bacteria in a more active, more stable and less toxic form than was possible in saline vaccines.

GONOCOCCUS GLYCEROL VACCINE.

Having successfully devised a method of preparing a stable pollen antigen (6), whereby the antigenic properties of the pollen protein are preserved by glycerol for a period of at least two years, we decided to find out whether or not glycerol would also preserve bacterial protein. Our first application of glycerol in the preparation of a bacterial vaccine was made with the gonococcus for two reasons: first, because it is an organism which, in the living cultures, shows evidence of rapid destruction by autolysis which is so complete that smears made from young cultures show large numbers of autolyzed forms often referred to as ghosts; second, in the form of a saline vaccine it has not yielded uniformly satisfactory results.

The gonococcus saline vaccines, by the time they reach the practitioner, probably contain a considerable amount of nonspecific products of autolysis with an indefinite and changing amount of antigenic substance which prevents any scheme of dosage from establishing a systematically increasing degree of immunity. This may possibly account for the failure of saline vaccines to uniformly produce efficient immunity.

PREPARATION.

The gonococcus glycerol vaccine is prepared as follows: The ten so-called Torrey strains of the gonococcus are grown on the surface of nutrient agar in Blake bottles. The sixteen hour bacterial growth is washed in normal saline by centrifugalization to free it from autolytic products formed during the growth of the bacteria. The bacterial mass, washed free from autolytic products, is immediately suspended in sixty-six and two thirds per cent. glycerol to prevent any further autolysis or deterioration of the bacterial protein. Since the vaccine is

not heated, there are no protein changes due to partial heat coagulation. The suspension is standardized by counting in a Thoma-Zeiss cell. Suitable sterility tests in broth are made, and safety tests are applied by the subcutaneous injection into white mice.

POTENCY TESTS.

There are two methods that may be employed for testing the potency of a bacterial vaccine: 1, by determining the degree of protection developed by vaccinated animals, and, 2, the determination of the antigenic value or measurement of antibody response following inoculation of animals. Since the gonococcus is not pathogenic for animals, the method of applying protection tests is not adaptable to the gonococcus.

However, comparative potency tests for the antigenic value were made with the gonococcus glycerol vaccine and with the usual gonococcus saline suspended vaccine. On October 13, 1919, a sixteen-hour growth of gonococci was suspended in saline and divided into two equal parts: one was centrifuged and made into a glycerol vaccine; the other was heated and made into an ordinary saline suspended vaccine. Both were made up to contain approximately fifteen billion gonococci to the c. c. On October 20, 1919, two series of six rabbits were immunized in the same way and with the same amounts: one series with the glycerol vaccine and one series with the saline. On November 12, 1919, using the same technic for complement fixation titrations as that adopted by the research laboratories of the New York City Department of Health, antibody content titrations were made of the sera from the two series of rabbits. In all the titrations, the same gonococcus antigen having a titer of 0.01 c. c. per unit was used. The sera from the rabbits immunized with the glycerol vaccine gave fixation of complement in dilutions up to one to five thousand; while the sera from the rabbits immunized with the saline vaccine produced fixation of complement in dilutions no higher than one to five hundred. This test shows, so far as it is possible to determine by the complement fixation method, that the glycerol vaccine possesses approximately ten times more antigenic power than the saline vaccine.

DETERIORATION.

In order to determine the rate of deterioration of the antigenic properties of the glycerol vaccine as compared with those of a saline vaccine, comparative complement fixation tests were made using freshly prepared gonococcus saline vaccine and gonococcus glycerol vaccine as antigens. Both vaccines were made on August 1, 1919, and each contained approximately fifteen billion gonococci per c. c. On August 8, 1919, using the same technic for complement fixation titrations as mentioned above, antigen titrations were made of each vaccine against positive antigonococcus serum, with suitable controls. The glycerol vaccine showed an antigenic activity forty per cent. greater than the saline vaccine. Both vaccines were then placed in the refrigerator at a temperature of 8° C. and were again tested for antigenic activity by the complement fixation method approximately one year later. The

gonococcus glycerol vaccine gave the same degree of fixation of complement as when tested one year previously; while the saline vaccine showed a loss in antigenic power of about seventy-five per cent. This test shows, so far as may be determined by the complement fixation method, that glycerol preserves very completely the antigenic properties of bacterial protein for at least one year; and it also shows that there is a distinct loss in antigenic properties in the saline vaccine.

This method of preserving the antigenic properties of gonococcal proteins in glycerol has also been applied to other bacteria, including the pertussis bacillus, pneumococcus, staphylococcus, typhoid and paratyphoid bacilli.

DOSAGE.

In order that the gonococcus glycerol vaccine might be available for general use by the medical profession, it has seemed advisable to make the glycerol suspension of bacteria of such a concentration that one tenth c. c. will contain the required number of bacteria for a given dose. This plan permits of diluting the glycerol suspension with physiological salt solution, immediately before its injection. The one tenth c. c. of glycerol suspension is diluted to one c. c. which makes the final percentage of glycerol about six and two thirds per cent., an amount readily absorbed by the tissues without inconvenience to the patient.

In this concentrated form, the bacterial protein is kept under the preservative action of glycerol until immediately before its administration. This feature is worthy of emphasis because, if the glycerol vaccine is allowed to stand diluted any length of time before its use, the process of autolysis may occur and cause deterioration of the antigenic properties.

By preserving the gonococcal proteins in glycerol, it has been possible to establish a scheme of dosage, including unusually high doses, with practically no reactions. This result may be attributed not only to the absence of toxic autolytic products, but also to the stability of the glycerol vaccine which thereby insures the exact doses of active antigenic substances intended. Not only does the scheme of dosage seem to produce an efficient immunity, but it also appears to keep the patient desensitized to such an extent that relatively large doses are readily tolerated.

The dosage established for the gonococcus glycerol vaccine begins with one hundred million and progressively increases by that amount at each subsequent dose. The interval between doses is usually forty-eight hours; a convenient plan being to administer the vaccine three times a week. Improvement is frequently noted after a few doses, but the vaccine treatment is usually continued up to fifteen doses; the scheme of dosage ranging from one hundred million up to one thousand five hundred million. In certain refractory cases, however, the vaccine has been continued up to twenty doses; this last dose containing two thousand million.

The acceptance of a remedy in legitimate therapeutics should depend on the presentation of scientific data and on dependable evidence of its effectiveness in relief or cure of disease. Scientific investigation and clinical observation must go hand in hand, each

acting as a control on the other; and to submit a vaccine for clinical trial without successful preliminary laboratory investigation of its probable worth is an imposition on the profession.

Therefore, after having determined by laboratory tests that the gonococcus glycerol vaccine possesses approximately ten times more immunizing power than gonococcus saline vaccine and that the antigenic properties of the glycerol vaccine are completely preserved for at least one year, we decided to submit the glycerol vaccine to clinical trial to test its therapeutic value. Through the cooperation of several urologists, the vaccine was tested out in private practice and in hospital clinics.

The opinion of the urologists seems to be that the gonococcus glycerol vaccine possesses therapeutic value in the acute complications of gonorrhoeal infection, such as arthritis, epididymitis, vesiculitis and prostatitis. Their reports have been very encouraging.

SUMMARY AND CONCLUSIONS.

1. Laboratory investigations have shown that saline bacterial vaccines undergo rapid autolysis with disintegration of the bacterial proteins and loss of specific antigenic properties.

2. The products of autolysis are toxic and cause severe reactions.

3. Saline vaccines do not represent the full immunizing properties of the bacteria.

4. The gonococcus, even in living cultures, shows evidence of rapid destruction by autolysis.

5. Gonococcus saline vaccines have not yielded uniformly satisfactory results, probably because they contain a considerable amount of nonspecific products of autolysis and too small and variable an amount of unaltered gonococcal proteins.

6. The gonococcus glycerol vaccine is free from autolytic products.

7. Glycerol, being hygroscopic, prevents hydrolytic autolysis of the bacterial proteins, and the antigenic power is thus preserved.

8. Gonococcus glycerol vaccine possesses many times more immunizing power than a corresponding saline vaccine, because the glycerol vaccine contains the bacterial proteins in a relatively unaltered and stable form.

9. Glycerol completely preserves the antigenic properties of the bacterial proteins for at least one year. Hence, the glycerol vaccine is a relatively stable product and does not readily deteriorate.

10. The glycerol vaccine is not heated, thereby eliminating the possibility of protein changes due to partial heat coagulation.

11. The gonococcus glycerol vaccine is prepared in concentrated form so that the bacterial protein is kept under the preservative action of glycerol until immediately before its administration, when it is diluted with physiological salt solution.

12. The dosage established for the gonococcus glycerol vaccine begins with one hundred million and progressively increases by that amount at each subsequent dose up to one thousand five hundred million. For refractory cases, the dosage may be continued up to two thousand million.

13. The types of cases in which the gonococcus glycerol vaccine has been used in clinical trials with encouraging results are the acute complications of gonorrhoeal infection, including arthritis, epididymitis, vesiculitis and prostatitis.

14. The method used in the preparation of the gonococcus glycerol vaccine eliminates largely, if not entirely, the disadvantages of the saline suspended bacterial vaccines which seem to be, a, rapid autolysis of the bacteria, b, deterioration and loss of antigenic power, c, toxic reactions, and d, lack of uniform clinical results.

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A Floccule Inhibition Reaction in the Blood Serum in Syphilis

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Numerous floccule forming reactions in the blood serum in syphilis have been suggested as a means of diagnosis, all of them based upon the precipitation of substances from luetic serums by colloidal agents as contrasted with the absence of such precipitation in the serum of nonsyphilitics. In the test proposed by Gordon (1), however, this reaction is reversed, the precipitation occurring in

nonsyphilitic serums and being inhibited in the serum from cases of syphilis. According to Ubel (2), the reaction is to be explained by "the absorption of one colloidal substance by another, thus preventing its precipitation when a mild precipitant is added." The precipitating agent utilized is a one per cent. aqueous solution of bichloride of mercury and the test consists of the addition of five to ten drops of the solution to "several" cubic centimetres of the clear serum.

*From the Laboratories of the Pittsburgh and McKeesport Hospitals.

In nonsyphilitic serum a white, flocculent precipitate occurs at once or within three minutes while the serum of syphilitics remains perfectly clear. Ubel reports a series of fourteen cases with uniformly positive results. Although no adequate explanation of the reaction is available and the value of the reaction seemed questionable, it was determined, nevertheless, to try it in these laboratories.

The technic was standardized by adding to one cubic centimetre of clear, fresh serum in a narrow test tube, five tenths c. c. of the one per cent. bichloride solution and observing the result after five minutes. The same serums were simultaneously Wassermanned with a triple antigen battery consisting of cholesterinized human heart extract, acetone insoluble lipoids of human heart, and an alcoholic extract of syphilitic liver. A series of sixty-five serums was subjected to the test being derived from cases for diagnosis, normal, nonsyphilitic, and cases of known syphilis under treatment. The Wassermann reaction was strongly positive in fourteen cases (plus

four), weakly positive in three cases (plus two to plus three), and the remainder of the serums were Wassermann negative.

While occasionally the formation of a precipitate was somewhat retarded, in only six cases did flocculation fail to occur after the addition of the bichloride solution and within the five minute period. One of these serums was Wassermann positive (plus four) the other five being Wassermann negative.

CONCLUSIONS.

While it was originally intended to carry the reaction out in some hundreds of cases, the fallacious results obtained indicated that the test was unreliable from a diagnostic viewpoint and it was, therefore, abandoned.

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Nature of Antibodies and Complement in Relation to Immunity

With an Explanation of the Wassermann Reaction

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Ever since Metchnikoff discovered phagocytosis scientific medical men have made untiring efforts to pierce the darkness that veils the mechanism of defence employed by the animal body in its struggle against bacterial invasion. Wright, of England, was the first to direct these efforts into definite channels by his discovery of opsonins. In the intensified study of the blood which followed more so-called antibodies were disclosed and hailed by their discoverers according to the visible effects they produced as precipitins, agglutinins, or lysins. Their nature, however, and the rôle they play in repelling infection remains unknown, though their importance as means of defence is no longer doubted and is universally accepted. To cap the climax and to add rather than detract from the existing confusion, Heist and the Solis-Cohens (1) have recently shown that immunity may exist without agglutinins and opsonins.

I have already thrown some light upon these conditions elsewhere (2). It is the object of this communication to complete the information and to delineate clearly and definitely the nature of the different antibodies and of that mysterious substance called complement, which plays such an important rôle in the Wassermann and other blood reactions. To accomplish this end, I propose to pick up and gather together the literary strands and weave them into a complete fabric by harmonizing seemingly conflicting clinical and experimental findings and adding such new views and ideas as are necessary to complete the picture.

As a basis upon which to build I wish to take the now well established and, I think, undisputed fact

that the defensive mechanism of the body rests upon a process of digestion. With this expression I mean to say that whatever complex organic matter, dead or alive, enters the animal blood stream or the lymphatic system is first disintegrated, that is, digested and then excreted.

This fact conceded, we are at once carried far towards our goal: the disclosure of the nature of antibodies and of complement. Nature always uses the same means to accomplish the same ends. It follows immutable laws, and capriciousness in the sense and meaning used by Dr. Simon Flexner in his article on biological therapy (3) does not exist.

From this viewpoint it will prove highly profitable to throw some light upon the digestive mechanism of the blood, called parenteral digestion, by recalling some of the facts we already know about the digestive mechanism of the stomach and the bowels, called enteral digestion. It is not necessary, however, to rehearse the entire subject. Only a few salient points will be emphasized, as they are needed for our purpose.

The digestion within the stomach and the bowels is accomplished by ferments. For protein digestion in the stomach we have pepsin and in the bowels trypsin. Pepsin and trypsin are much alike in so far as they both serve the purpose of breaking down proteins. They differ, however, considerably in so far as pepsin requires the cooperation of an acid, while trypsin is supported in its action by an alkali. Thus, the acid in the case of pepsin and the alkali in the case of trypsin enter into the process of digestion as a second indispensable factor in addition to the ferment. Consequently, we have the following

two combinations: Pepsin acid combination=protein digestion; trypsin alkali combination=protein digestion.

In these combinations, however, the part played during digestion by pepsin and trypsin is entirely different from that played by the acid and the alkali. Pepsin and trypsin are ferments. As such, they have the peculiarity that they are not consumed during their activity in the same degree as digestion proceeds. For instance, one part of rennet ferment can precipitate 800,000 parts of casein, and one part of pepsin can digest 500,000 parts of protein. On the other hand, the acid, for instance, in the stomach is used up in the same proportion as proteins are broken down. That is to say, to break down a certain quantity of protein requires a definite quantity of acid. Consequently, as the acid is consumed, it must be renewed continually to keep digestion going. To use a plain simile, I will liken the pepsin to a carpenter, the acid to his tools, and the protein to the lumber he fashions. We have then the following combinations: Pepsin acid combination=protein digestion; carpenter tools combination=lubber fashioning. Taking the acid from the pepsin is like taking the tools from the carpenter. Deprived of their implements, neither of the two can accomplish the allotted task.

Throughout the animal kingdom digestion is arranged in two phases: an acid phase followed by an alkali phase. Even in the food vacuole of the protozoon, these two phases can readily be distinguished, as the initial acid reaction of the digestive fluid turns gradually alkaline, as digestion proceeds. In higher animals, this change of reaction does not take place until the proteins are discharged from the stomach and arrive in the bowels.

An interesting feature characterizing the essential difference between the two kinds of digestion is the fact that the pepsin acid combination does not break down the protein molecule into its ultimate bausteine. It carries the cleavage only to the stage of peptones. As such the proteins are discharged into the bowels. Here the disintegration is continued by the trypsin alkali combination until those simple compounds are reached that are ready for absorption in the form of amino acids.

If, as I asserted, Nature always uses the same means to accomplish the same ends, we must find the same principles involved in parenteral digestion as we found them in enteral digestion. This is, indeed, the case. The analogy is striking and the comparison gives us some of the details of parenteral digestion with an exceptional clearness and precision.

In approaching now the digestive processes occurring in the blood, it serves our purpose best to begin with studying the fate of particulate foreign protein in the shape of dead bacterial bodies, when injected into the blood stream. Nagao (4) found that, after an intravenous injection of killed, non-hemolytic streptococci into the guineapig, most of the cocci were taken up into leucocytes within five to ten minutes; that no free cocci could be found after thirty minutes; and that cocci could be found in the circulating leucocytes no longer than three hours.

These experimental findings confirm the well-known fact that phagocytosis is the first step taken by Nature in initiating the parenteral digestion of particulate protein, such as the bodies of dead bacteria.

The disappearance of the ingested cocci within the leucocytes is the next step we observe. It is due, as we know, to the disintegration, that is, the digestion of the bacterial bodies by the cell. There are some interesting features connected with this digestion. Unicellular organisms, such as the white cells of the blood, have no preformed stomach. Wherever the food—as in this instance the bacterial body—lodges, a vacuole forms, which serves as a stomach. Into this vacuole the digestive fluid is secreted that begins the disintegration of the germ. As it was to be expected from the comparative study of the enteral digestion, this digestive fluid has proved to be of acid reaction, probably due to the presence of hydrochloric acid. Thus, by forming billions of tiny stomachs within the cells, Nature succeeds in overcoming the seemingly unsurmountable difficulty to initiate also the parenteral digestion in an acid medium, even within the alkaline fluid of the blood.

In the protozoon, both the acid and the alkali phases of digestion run in the same vacuole, one after the other. This could not be otherwise, because this one cell organism is an entity and lives a separate life. Entirely different conditions, however, obtain in reference to the white cells of the blood. They, though unicellular organisms, are part and parcel of a highly complicated mechanism and, as such, must abide by the laws that govern the whole. Here the acid and the alkali phase of digestion each has its separate place. In enteral digestion we have the stomach and the bowels respectively. In parenteral digestion we must expect the same division, though arranged in a more simple and primitive way. In addition, we must expect that the digestion within the white cells is carried no further than to the formation of peptones. As a proof of this and that the protein cleavage within the blood cells is not continued to the formation of amino acids, I adduce the wellknown local and general reactions that follow the injection of vaccines. If the protein were split within the cells into its ultimate fragments, there would be no symptoms when they reach the circulation, as these ultimate fragments are innocuous. The symptoms that follow the injection of vaccines, therefore, strongly suggest that the cleavage of protein is carried within the white cells only to the stage of soluble peptones and that these peptones as such are discharged into the circulation. This suggestion is supported by the facts that the time for the emptying of the stomach is about the same as for the disappearance of the cocci from the leucocytes, as shown by Nagao; and that this time also corresponds approximately with the beginning of the reaction after vaccine injections.

Furthermore, there are other considerations that sustain the correctness of these views. There is, first, the usefulness of the measure. The discharge of the products of incomplete digestion into the blood stream greatly facilitates and hastens the develop-

ment of antibodies as these soluble split products lead to a much quicker and far more generalized sensitization of the cells of the host than the comparatively few particulate bacterial bodies could possibly accomplish. Cells are not sensitized, that is, stimulated to produce specific digestive ferments, unless the sensitizing food, called antigen, comes into direct contact with them.

Then, second, this same discharge from the cells initiates the tremendously important secretion of digestive ferments, that is, of antibodies, into the serum. After the discharge the food to be digested is in the blood stream which surrounds the cells. Thus, the blood becomes now the digestive fluid and the exterior of the leucocytes is turned into the digestive surface. Consequently the ferment needed to complete the digestion of protein begun within the vacuoles must leave the cells to meet the food and are discharged into the blood stream for the same reason why pepsin is discharged into the stomach and trypsin into the bowels. This marks the beginning of the second, the alkali, phase of the digestion.

A beautiful and most convincing illustration of the identity of the digestive ferments with the antibodies in the serum has been furnished recently by the seemingly conflicting findings of Heist and the Solis-Cohens as compared with those of Black, Fowler and Pierce (5): Heist (6) showed that there is in the blood of animals a property inimical to the growth of organisms to which the animal is immune. This substance is present in the whole coagulable blood of the immune animal and is not demonstrable in the serum. When injected to cause artificial immunization the same property appears in the immunized animal. In marked contrast are the findings of Black, Fowler and Pierce (5) which demonstrate that in animals freshly immunized against typhoid and dysentery bacilli the bactericidal power of the serum is equal to that of the whole blood. In other words there were no digestive ferments, or antibodies in the immune serum examined by Heist and the Solis-Cohens; but there were plenty of them in the serum of the animals immunized by Black, Fowler and Pierce. None of the authors has an explanation to offer.

However, an interesting and illustrative light is thrown upon these puzzling newer findings by the older experiments of Victor C. Vaughan and his collaborators (7). They found that guineapigs, when injected with horse serum, develop in their blood specific digestive ferments that can be demonstrated from the sixth to the thirtieth day after injection. Then these ferments disappear. The reason for their disappearance is not stated but it is obvious. Ferments are needed only so long as food is to be digested. Therefore, when the blood stream is relieved of all foreign protein the ferments vanish as they vanish in the stomach and in the bowels when digestion is finished and the digestive organs are at rest. In this way, with the foreign protein removed, immunity, too, assumes, so to speak, a resting state. This resting state need not necessarily curtail immunity in spite of the absence of antibodies. The cells that furnished the ferments remain sensitized and are prepared and ready

to pour forth new ferments the moment they are needed. If these sensitized cells are transfused into another animal, resting immunity is transferred with them and the same property appears in the immunized animal.

In order to differentiate between the different antibodies and to determine their relative value and position from an immunizing viewpoint let us consider why Nature employs two kinds of digestion: a pepsin-acid and a trypsin-alkali digestion.

In the vacuole of the protozoan we notice that no visible change takes place with the food morsel during the acid phase and that liquefaction does not begin until the reaction turns alkaline. Furthermore, in higher animals and in humans the operative removal of the entire stomach is not incompatible with health and life. Therefore, we can safely conclude that in enteral digestion the action of the trypsin-alkali combination is basic, while the action of the pepsin-acid combination is only preparatory. In parenteral digestion, conditions are much the same. Phagocytosis, which presents the acid phase of the parenteral digestion, is not essential. According to Black, Fowler and Pierce, it gradually disappears as the higher degrees of immunity are reached and is conspicuous by its absence in the fully developed immunity. In this latter instance bacterial bodies, as Vaughan puts it, dissolve in the serum like salt or sugar in water.

Thus, in enteral as well as in parenteral digestion the acid phase can have but one purpose, namely, to facilitate and quicken the process of digestion. The necessity for doing so may not be so apparent in enteral digestion, but it is apparent in parenteral digestion. When pathogenic microbes gain entrance into the animal body minutes may count when rushing the defensive measures, so that the elaboration of defensive ferments, that is, of antibodies, gets into full swing at the earliest possible moment.

To show more clearly and conspicuously the difference between the pepsin-acid and the trypsin-alkali digestion let us take up again the simile of the carpenter-tool-lumber—and compare the action of the pepsin-acid combination to that of the power saw mill and the action of the trypsin-alkali combination to the one of the carpenter with his hand saw. The power mill cuts the logs into rough boards with a course saw; the pepsin-acid combination splits the protein molecule into rough blocks with the assistance of one of the strongest and most powerful acids known. The rough boards are then readily worked by the carpenter with his hand saw; and the rough blocks of peptones are easily split by the trypsin-alkali combination. That in developed immunity and in the later stages of developing immunity the powerful work of the pepsin-acid combination is no longer needed and phagocytosis, consequently, abandoned is due to the readily appreciated fact that as hundreds or thousands of carpenters with hand saws can accomplish as much as a power mill, so the enormous number of ferments poured forth into the blood stream can do the necessary preparatory work as quickly and efficiently, or even better, as it has been done in the beginning by the pepsin-acid combination.

In now looking over the different digestive fer-

ments of the blood, or antibodies, for classification we find that all of them with the exception of the lysins have the obvious purpose to hasten phagocytosis. I have, therefore, called them elsewhere (2) "preparatory ferments." They disappear as soon as phagocytosis is no longer needed. The lysins are the mainstay of immunity and are in their nature equivalent to the trypsin. They are the only ferments, or antibodies that are present in fully developed immunity.

In this connection I wish to make a logical deduction from the foregoing that seems to me to be of great practical importance as to the valuation of immune serums. So far as I can see from literature there exists at present no index to determine during the manufacture of serums if the animal is fully immunized, or if a given serum comes from an animal with fully or only partially developed immunity. With the recognition that opsonins and agglutinins are but preparatory ferments such an index is now furnished. If opsonins and agglutinins are present, the serum comes from an animal not fully immunized and the more of them are present the less immunization was accomplished.

This suggestion is in direct contradiction to a statement made by Dr. Weaver (8), of Chicago, who says: "The serum appears to owe its activity largely to the specific opsonins it contains. The opsonins are not present in high concentration, and consequently, only large doses of serum can be expected to possess therapeutic activity."

Before entering upon the explanation of the Wassermann reaction, we have to give some more consideration to the nature of the so-called complement.

In previous lines it has been demonstrated that ferments require a chemical tool to enable them to perform their work. This chemical tool is the mysterious complement. It is an ordinary chemical substance and is consumed during digestion in direct proportion to the work accomplished. In other words, to digest a certain unit, say one gram of protein, requires a definite quantity of complement. When this complement is gone, digestion stops in spite of the presence of active ferments unless new complement is again provided. In terms of immunity it means that, when the complement is consumed, the defensive apparatus of the body is paralyzed and in serious cases death much ensue unless new complement is again supplied. A clear and definite conception of this peculiarity of complement is of fundamental importance.

As we penetrate deeper into the mysteries of digestion, and particularly into the perplexing phenomena of immunity it becomes evident more and more that all ferments, enteral or parenteral, require this chemical tool or complement. However, we have definite knowledge only of two ferments and their complement. There is, first, the pepsin and its complement, the hydrochloric acid—and, second, the antishoop ferment, employed in the Wassermann test with its complement, the presence or absence of which makes this test negative or positive, as we will see later. Under these circumstances, it will help much to clear the still hazy situation and to establish more firmly the principles involved by showing that trypsin, the well known enteral fer-

ment, is unable to digest protein without a chemical tool or complement.

For many years it has been known that trypsin loses its power to digest casein if blood serum is added to the mixture. Rosenthal (9) investigated this curious phenomenon and from his experimental findings came to the conclusion that the antitryptic action of the blood serum is due to the presence of digestive split products. When they are abundant, the antitryptic action is increased; when the blood is poor in the products of protein metabolism, the antitryptic property is decreased. In confirmation of these conclusions Rusznak (10) has shown that in the antianaphylactic state or during the recovery from an anaphylactic shock the blood is laden with digestive products and the antitryptic titer of the serum is greatly increased.

The logical deductions from these investigations lead us to some startling conclusions. The antitryptic action of the serum can not possibly be due to a direct influence of the digestive split products upon the trypsin itself. This is absolutely excluded by the fact that in the bowels the trypsin continues to work in spite of the presence of a highly concentrated solution of such digestive products. If their action were direct upon the ferment, bowel digestion would stop soon after these digestive products appear. We must, therefore, look for another cause of the acknowledged antitryptic action of the protein split products. This cause can be no other than the fixation of the complement, in the light which has been thrown upon the working conditions of ferments by the phenomena of the Wassermann and other blood reactions, and by the ostensible influence which the products of protein digestion, specific or nonspecific, exert in rendering ferments impotent by robbing them of their chemical tool.

In following up this highly interesting lead, we are logically forced to the conclusion that, in order to keep digestion going in the bowels, a stream of complement is being supplied to the trypsin in the same way as it is supplied to the pepsin. Though more definite proof is still lacking, the facts adduced are highly suggestive that this is the case.

A better knowledge of the conditions most favorable to the action of trypsin will prove of great practical value from the viewpoint of immunity due to the close relationship of this ferment to the lysins of the blood. The future scientific treatment of infectious diseases must aim not only at destroying the toxic substances derived from the parenteral digestion of the germ, but must also stimulate the activity of the defensive ferments and at the same time either supply an abundance of the necessary complement or protect the natural complement from useless destruction. Most remarkable clinical results from therapeutic measures applied along these lines have convinced me that this not only feasible but also readily accomplished.

In giving the following explanation of the Wassermann reaction all references to the cumbersome details, as they concern the laboratorian, are omitted. Only the principles are evolved. It gives physicians a practical illustration of complement fixation, as it looms today to be probably the greatest single factor in the pathology of infectious diseases.

If we inject any foreign protein into the blood of an animal the system of the injected animal proceeds immediately to remove this foreign protein. To this end specific ferments are elaborated by the cells of the animal. These ferments disintegrate foreign protein and disintegration products are excreted.

Sheep corpuscles are foreign protein to the guinea-pig. If we inject sheep corpuscles into the blood of a guinea-pig, the cells of the animal elaborate specific ferments to disintegrate the sheep corpuscles. These specific ferments are also called antisheep ferments. The process is called sensitization of the guinea-pig to sheep corpuscles. The animal is sensitized because its blood contains no specific ferments that disintegrate sheep corpuscles.

If we take the serum of such a sensitized guinea-pig, which is swarming with these specific ferments, and mix it with washed sheep corpuscles in a test tube the specific ferments will immediately begin to disintegrate the sheep corpuscles. As sheep corpuscles are disintegrated the hemoglobin they contain diffuses into the surrounding fluid and colors it red. We then have hemolysis. No ferment can do its work without a chemical tool. In order that the specific antisheep ferment may dissolve the sheep corpuscles in the test tube we must supply it with its chemical tool. The exact chemical composition of this chemical tool, or complement, is as yet unknown, but it is known that it is contained in the blood of certain animals. Therefore, in order to supply the antisheep ferment with its chemical tool, we add a definite portion of an animal serum we know to contain it.

Suppose now we have in the test tube the sheep corpuscle dissolving (antisheep) ferment plus its chemical tool (complement), then add washed sheep corpuscles and place it into a warm water bath. The ferment will then immediately attack the sheep corpuscles with its chemical tool and dissolve them. The fact that sheep corpuscles are being dissolved is disclosed to the naked eye by the reddening of the fluid, as hemoglobin is liberated and diffused.

Suppose we have in the tube the same antisheep ferment plus its chemical tool, then add washed sheep corpuscles and in addition a substance that unites with the chemical tool and makes it useless—the antisheep ferment, robbed of its tool, can no longer dissolve the sheep corpuscles. Consequently, no hemoglobin is liberated and the fluid remains uncolored. The blood of syphilitics contains such a substance that is able to unite with the complement and makes it useless. This substance, as I have shown elsewhere (2), is a split product derived from the disintegration of the dead treponema, the syphilitic germ. This substance is, therefore, not contained in the blood of healthy persons.

The Wassermann reaction works now out as follows: If we take into a test tube antisheep ferment, add the necessary chemical tool, or complement, and washed sheep corpuscles plus the blood of a healthy person—there is no interference with the complement. The ferments disintegrate with their chemical tool the sheep corpuscles, hemoglobin is liberated and diffuses and colors the solution red. This means we have hemolysis, indicating a negative Wassermann reaction.

If, however, we put into the test tube the same antisheep ferment, add the necessary chemical tool, or complement, and washed sheep corpuscles plus the blood of a syphilitic person—the syphilitic split products unite with, or fix, the complement and make it useless. Consequently, the ferment, robbed of its tool, cannot disintegrate the sheep corpuscles, no hemoglobin is liberated and the solution remains uncolored. This means, we have inhibition of hemolysis, indicating a positive Wassermann.

There remains but one more point to be discussed, namely, the purpose of the so-called antigen, as used in the Wassermann reaction. It is a substance which must be added to the test tube or the reaction does not materialize. This antigen has formerly been considered to be of specific nature. It consisted in the beginning of an extract from syphilitic livers. The idea of specificity has gradually been dropped, as it was found that the extract from many other organs, syphilitic or nonsyphilitic, served as antigens just as well. Even artificial lecithin was found serviceable.

As new substances were found that could be used as antigen the mystery of its function deepened. Not even a suggestion has been offered as to what its function might be. Surely, it is not required within the circle of the reaction. To my mind, the function of the antigen is mechanical rather than chemical. If we look over the available antigens we find that they are extracts from organs rich in nervous tissues.

Nervous tissues contain a good deal of lecithin or other fatlike substances. That these fatlike substances represent the active principles of the antigen seems to me highly probable. On the other hand evidence is accumulating that the specific syphilitic split product that binds the complement is a lipid, another fatlike substance. Fat, or fatty substances, that remain in the finest subdivision so long as they are within the body in their natural surroundings, gather in smaller or larger droplets when leaving the body. A striking example of this kind is furnished by the gathering of the butter fat within the milk after milking. My opinion that this is also the case with the syphilitic lipoids has been strengthened by the report of Munk that these lipoids appear as droplets in the urine. In droplet form these lipoids could not act upon the complement. To make the chemical union with the complement possible, it is indispensable to redisperse these lipoids in order to increase their surface. It is this redispersion that I believe to be the function of the antigen.

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Syphilis

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The problem of syphilis in the United States has come to be recognized as something more than a medical problem; it is one of the great economic problems of the country, a rapidly increasing problem, in all probability, and one which is bound to be more and more considered from a governmental viewpoint with the passing of time. The discovery of the *Spirochæta pallida* as the causative agent in syphilis, by Schaudinn and Hoffman, and the subsequent development of the Wassermann reaction by Wassermann and also by Detre, although his name seems to be pretty generally forgotten, heralded the beginning of an accurate knowledge as to the generalized spread of this disease.

Hudelo, of Paris, gives as the three most important periods in the development of our knowledge of syphilis, first, the addition of the *Spirochæta pallida* by Schaudinn in 1905; second, the Wassermann reaction developed in 1906 by Wassermann, Neisser, Bruck and Schucht; and third, the development of the spinal fluid reaction. He might well have added Ehrlich's discovery of 606 to our armamentarium as of much more far-reaching effect than any of the others since the latter is the curative agent and the former are of only relative importance as an aid to diagnosis and a check upon our treatment.

The incidence of syphilis in the United States is an unknown quantity because there are so many cases which are never recorded and because there are some which are reported more than once. In the various states there is no uniformity in regard to the recording of cases and it has been little more than a decade since there has been any method of accuracy in scientific grouping. While there are no statistics which are of much help it was generally agreed that the incidence of syphilis in the United States, previous to the great war, was not far from fifteen per cent. of the entire population and it is probable that these figures were much too low. It is well known that among prostitutes, who have pursued that method of earning a livelihood for any considerable time, fully eighty per cent. will show a positive Wassermann reaction. Southard, in six thousand tests, found twenty-three per cent. positive but his experiments were made in a neuropathic institution and there, it must be generally admitted, the natural incidence would be high. Rosenberger, at the Philadelphia General Hospital, in 1916, found twenty-seven and four tenths per cent. positive and here again, in a general hospital, the percentage would probably be higher than in the general public outside. Vedder, in the Army, examining recruits, came to the conclusion that sixteen and seventy-seven hundredths per cent. represented the number of syphilitics applying for service and that these figures represent the general percentage between the ages of twenty and thirty. He says that there is good reason for believing that it would reach fully twenty

per cent. and that it would apply to the civilian population. Irving, after investigating, came to the conclusion that ten to fifteen per cent. of the population of the state of Minnesota were syphilitic. Routh estimates that in England and Wales alone there are twenty-seven thousand infant deaths every year from syphilis. Leredde, of Paris, estimated that the war had contributed three hundred thousand fresh cases of syphilis to France but Simon, of Paris, sharply criticized him for this unsupported statement and thinks that ninety thousand would be well above the maximum. Nevertheless Brocq is inclined to agree with Leredde.

Day and McNutt, in 2,925 hospital cases admitted for general conditions, found in white males thirty per cent. Wassermann positive, white females sixteen per cent. Wassermann positive, colored males forty-eight per cent. Wassermann positive, colored females forty per cent. Wassermann positive.

Lavin found in Canadian soldiers, white thirteen and eight tenths per cent. positive, colored twenty-four and one tenth per cent. positive.

However, so far as the United States is concerned, if we accept fifteen per cent. as a prewar basis it is certainly well within reason to assume that it is much higher today and it is quite within the range of possibility that it will reach twenty per cent. of the population.

When we consider that this is one of every five inhabitants it would seem as if the problem had ceased to be entirely a medical one and had become a problem to be dealt with by all governments on general economic lines. That phase of the question, however, must be left in the hands of the politicians, the well meaning social workers and others equally intelligent and with equally selfish or equally hysterical notions which they try to foist upon us from time to time, and one can easily visualize what the result will be. Sometimes I have thought that the ultimate answer to this problem will only come with years when the blood of the world shall have become sufficiently contaminated, syphilized, so that an immunity will ultimately develop and the disease will become of as little moment as any of the ordinary exanthemata.

Measles will wipe out of existence an aboriginal people, yet civilization and ages of this disease, with its consequent increase of immunity, has relegated measles into a secondary place, so far as mortality is concerned. If one studies the mortality statistics of measles he will probably be astonished at the number of deaths caused by this disease, but there is no doubt that the generations who have suffered have contributed to their offspring a resistance, which has done much to minimize the ill effects which are so pronounced in an aboriginal people.

The treatment of syphilis, since the discovery of the *Spirochæta pallida* was recognized as the causative agent and especially since the discovery by

Ehrlich of salvarsan, has undergone some marked changes and there have been many and various technics developed including intravenous, intramuscular and even rectal use of these newer arsenical preparations, to say nothing of the intraspinal use of salvarsanized serum as developed by Swift-Ellis, Ogilvie and others. In the first days of intravenous medication with the arsenical compounds the use was more or less limited to a comparatively small number of men but as the technic developed quickly it was used by increasing numbers as the profession became more and more used to the idea that it was feasible and that few untoward accidents occurred when these comparatively large quantities of solution were introduced directly into the blood stream. There are two bad features following, as a natural sequence, our first enthusiasm. The majority of the syphilitics in the days beginning ten or twelve years ago, were unfortunate because many of them were told that a few doses of 606 and a few months of mercury meant an absolute cure. I do not mean that all patients were so told or that this was the custom among the more conservative or more intelligent of our profession but it certainly was the rule of a number of men and hospitals that were using the newer arsenical compounds. Many of these patients were turned loose, half treated, in our opinion, even much less efficiently treated than in the old mercurial days, and while some of them have since been undeceived there are legions of these patients going about today self-satisfied in their ignorance, believing themselves free of their disease because they received a few doses of salvarsan and a few months of mercurial treatment. The result of this ignorance on their part and fatuous, mistaken, optimistic opinion on the part of their medical advisers, will be reflected within the next few decades. They are already beginning to come back. Now what are the great desiderata for the handling of this problem on broad, general lines? First, prevention of infection, second, treatment after infection.

The first we may dismiss with only a few words. Generally disseminated knowledge of prophylaxis after exposure will be about as far as we shall be able to go in this direction and thanks to the war the idea of this is pretty well known even if not observed. Legislative action of any kind is of little effect. There remains only the treatment after infection and here we are, unfortunately, as a profession (in my opinion) at fault. We may divide this into two phases: First, efficiency of medication, second, control of the patient.

These two must work efficiently, otherwise we fail. We are not interested either medically or economically in whether an individual patient with syphilis might be cured under some special form of treatment or under special conditions which would be impossible to carry out except in a very limited number of cases. This would get us nowhere. We are interested in the development of a cure, or at least a help, which will reach all these afflicted individuals and which must be made of such a character that it may reach all of them.

EFFICIENCY OF MEDICATION.

There are only two drugs which are important in this connection, viz.: arsenic and mercury.

The possession of efficient antisyphilitics is important and perhaps in this we are to a great degree fortunate because while we possess no great *sterilizans magna*, either in the arsenicals or in mercury, we at least possess two substances, which, used intelligently and intensively enough will at least deal satisfactorily with ninety-five per cent. of the cases of this dread disease. Will it cure completely? That is the question for the future to decide.

We must not forget that a few decades ago, when we of the earlier generation were beginning practice, we depended entirely upon mercury. We must not forget that of the many patients which were seen in those days many have married and raised apparently healthy families. There have been some horrible later catastrophes but in the main the greater proportion of these unfortunates have not known the horrors which in those days we were taught to expect. We must also remember that many of these patients were very inefficiently treated and that as we now know, nearly all of them were uncured. In some of them paresis developed, some of them became tabetics, some of them died of apoplexy before fifty and some of them died of syphilitic complications, which were classed otherwise and went unrecognized as such, but in the entire sum total of cases which I can remember there was not such a great percentage after all. And today, as we have a much more efficient armamentarium than we had in those days, we may logically expect an increase in the efficiency of our medication. Under mercurial treatment we know there were few cures and yet, even today, the profession is not entirely in accord as regards the value of the arsenicals. France is distinctly divided into arsenical and mercury camps. Bory in France, still claims precedence for the mercurials and uses benzoate of mercury. Dufour says mercury is efficient, but differs from Bory in that he does not think that it is superior or supplants the arsenicals. Arujo of Brazil prefers mercury, especially in children. Sutton of Kansas City prefers mercury still and I am of the opinion that if all the facts of the case were known we should all be surprised at the large number of the medical profession who still use the mercurials alone in the treatment of syphilitic condition. Craig of the U. S. Army records sixty-eight cases under mercury treatment by mouth alone, from nine months to three years, and not one case gave a frankly negative Wassermann. His cases, even when treated by intramuscular mercury, with thirty injections of grey oil, were still positive to the Wassermann test.

METHOD OF TREATMENT.

There are almost as many methods as there are men and there are also many preparations of salvarsan or allied substances. All are arsenicals grafted upon the benzol ring chemically. All solutions of salvarsan and allied products are toxic and the neosalvarsan is weaker in action than the old. All preparations of 606 in isotonic salt solutions are hemolytic and this property is increased by adding sodium hydroxide beyond the point of neutralization but this is offset by a decrease in the toxicity in the alkaline products. Leary of Boston thinks most of the bad results come from an acid prepara-

tion and advises the addition of sodium hydroxide. Kolmer says that the concentrated solution is more hemolytic than the dilute. He avoids overneutralization of his solution with sodium hydrate and leaves no excess. He uses a dilute solution and injects slowly. Neosalvarsan is not ordinarily hemolytic in a concentration of ninety one hundredths grams to thirty c. c. of solution and he says that one tenth gram may be used in three c. c. of distilled water. The toxicity of neosalvarsan is less by far than 606 and the ease of preparation makes it much to be preferred in the treatment of the disease. As Schanberg points out, it must be used more often than 606. Neosalvarsan, as shown by Schanberg, is two and four tenths times less toxic than 606. Its spirocheticidal activity is somewhat less than 606 in about the proportion of one to one and seventy-four one hundredths.

	<i>Salvarsan</i>	<i>Neosalvarsan</i>
Schanberg gives it.....	1.	1.74
Castelli	1.	1.5 to 1.78

and says, therefore, sixty one hundredths grams of old 606 is equal to one and five one hundredths grams neosalvarsan instead of ninety one hundredths grams, but the margin of safety is much greater than with 606 and even this holds good of a one and five one hundredths grams dose of neosalvarsan in comparison with six tenths gram of salvarsan.

The experiments of Levaditi seem to demonstrate that the action of 606 is not a direct spirocheticide but Sabernaud (*La Clinique*, 1913) showed that by the addition of liver extract it became so *in vitro* at least. So that it is possible that these arsenicals must act on the syphilitic spirillæ either by being activated by liver extract or some other organic substance, either chemically or catalytically. At any rate they are all poisonous to the human economy and must be used with care. There are few contraindications to their use. Ravaut thinks the only contraindication is impermeability of the kidney. He uses neosalvarsan. Cachexia, decompensation of the heart and any complication of the kidney must be carefully considered. The only death which we have had was in a case of extreme cachexia from malignant disease, in which, with consultation, we decided to take the risk. We think we were unwise, in the light of the results, but autopsy did not justify the diagnosis of death from salvarsan and we therefore excluded it from our bad results.

So that everything considered, the ease of administration, the ease of preparation and the decrease of toxicity more than counterbalance the increase in spirocheticidal power of 606 in favor of neosalvarsan because by the difference in dose and increase in the number of injections, spaced at shorter time limits, the difference can be equalized.

There is little need of discussion regarding the various preparations which are on the market. They are practically all the same. Some, perhaps, are more toxic than others and in our experience the ones which we now use are inferior to the old brands of salvarsan and neosalvarsan. The consensus of medical opinion in all countries seems to tend to the intensive form of treatment. The old idea of one dose, or at most two, seems to have passed

although there are some men who still cling to this form of medication.

Heidingsfeld came to the conclusion after seven years' experience, that one injection at a time was the better treatment and he changed his viewpoint from intensive medication evidently on his serological record alone, but there are only a few who share his view. He believes the patients become Wassermann fast on too intensive treatments. He gives a full dose of 606 and does not repeat it for six months if there is a negative Wassermann reaction. If, however, there is no change in the Wassermann he repeats it in four months. He employs both a Wassermann and Hecht Weinberg control.

QUANTITY OF DRUG.

It is generally agreed by most observers that a degree of tolerance to arsenical preparations and also to mercury is gained by the spirochete by repeated doses and Noguchi showed that the increase in tolerance to 606 and 914 was five and a half times the original tolerance within three or four months. He also showed that this resistance disappears when cultivated in drug free media for several generations so that it is quite probable that a certain interval should follow between series of injections.

Heidingsfeld, in a series of 456 cases, found that 154 became serologically negative after one injection and clinically free of symptoms. One hundred and seven became negative after two administrations, fifty-three became negative after three administrations, twenty-seven became negative after four administrations, nine became negative after five administrations, seventeen became negative after six or more administrations. This is eighty per cent. Eighty-nine were still positive, but sixty-five of these were clinically symptomless. Under his method ninety-five per cent. of the patients went to clinical recovery but only eighty per cent. to serological recovery.

Craig showed five hundred cases in 1917. Fifty-seven and six tenths per cent. became negative and in most of the cases there was only one injection.

Noguchi in a series of 102 cases showed that thirty-three and seven tenths per cent. became negative, also with one injection for the most part.

Craig discussed the efficiency of the intramuscular method over the intravenous and drew the conclusion that the intramuscular injection was more efficient. Many syphilitic patients have become Wassermann negative following one or two injections of 606 but unfortunately they did not stay either Wassermann negative or clinically cured. In 198 cases treated by Craig, either intravenously or intramuscularly, eighty-eight and five tenths per cent. of his primary cases relapsed, eighty-four and three tenths per cent. of his secondary cases relapsed, sixty-nine and five tenths of his tertiary cases relapsed, and eighty-eight and eight tenths per cent. of his latent cases relapsed. The majority relapsed within eight months after cessation of treatment. One hundred of 172 cases that relapsed did so within the first three months. He says, however, that fully fifty per cent. of these patients received only one injection of 606. Nowhere in Craig's work does there appear to be any statistical tables dealing with

the intensive methods which are at present in vogue. So it would seem to be fairly well established, in spite of the few who still believe in using one dose, or one dose repeated at rather long intervals, that we must abandon any idea of a quick cure in these cases and we have come to believe in the rather intensive use of both forms of treatment.

Sargent says primary syphilis can not be cured by a few doses of 606 and a few months treatment with mercury. Perhaps, however, the one dose may be made to serve another purpose, prophylaxis.

Mangin, chief of the French Hospital at Manchester, inoculated himself with syphilitic virus in the presence of his staff and other medical men. One hour later he received one injection of sixty hundredths gram of salvarsan; syphilis did not develop. Many other exposed patients have received a prophylactic injection and the disease failed to develop. We have given four injections in patients whom we personally knew to have been exposed and in none of the four did the disease develop.

The German school swung rapidly to the arsenicals following the discovery of Ehrlich and later fell back upon the combination of arsenic and mercury. The English consensus of opinion, like the American, is in favor of the use of both drugs. Dufour, Hudelo, Chevallier, Simon, Balzer and Poullard in France use both. Gendrow uses galy, an arsenic preparation, Ravaut uses neosalvarsan, Spittel of Ceylon uses both. Herd and Lane of New Haven; Wile, Elliot, Schamberg, Pollitzer and Sachs of New York; Tauber of Cincinnati; Lynch, Hoge and Lane of Boston; Heidingsfeld and Williams, Solomon, Craig and Vedder and all the men in the Army use both. The Army regulation treatment in all countries subscribes to the combined use of both drugs. Pinaud of Versailles seems to be one of the few who distinctly warn against the use of arsenicals and mercurials together.

Much of the credit for this renewal of the Austrian idea of intensive treatment must be passed to Dr. Pollitzer of New York. Pollitzer says that he has seen so many of these supposedly Wassermann fast cases become negative on continuance of the treatment that he has become skeptical and he believes that three years of treatment are necessary before we can class any case as a fixed positive. He further believes that the cases intensively treated and with fixed positives after fifty can be left alone if symptomless. Pollitzer believes in the hammer blow at the start. He uses the full dose on four succeeding days and follows it with a series of courses combined with mercury.

Tauber of Cincinnati believes in intensive treatment. He uses four to six injections of three tenths to six tenths gram at three to seven day intervals with mercury at the same time and advises always three courses. After a plus Wassermann his minimum is three courses. He uses mercury either intramuscularly or by inunction. Twenty-four to thirty injections of mercury every other day if a soluble salt of mercury is used. Twenty to thirty rubs, one each day, if inunction is used. He gives one course of each type of mercury with each course of 606. He uses the Wassermann as a check at

two month intervals and continues until he has at least five unbroken negative reports.

In secondary syphilis he uses for the first year, three courses, six to eight injections of 606 and mercury, for the second year, if the Wassermann is still positive, plus three more courses. If the Wassermann is negative four injections of 606 and two courses of mercury. For the third year, if the Wassermann is negative, regular periods of examination only. If positive three courses each of 606 and mercury. He thinks most syphilitics are undertreated and in this we agree.

White, McWharther and Barber use seven primary intravenous injections of 606 and seven intramuscular injections of mercury and follow these by other courses as necessary. They reported eighty-three and five tenths per cent. negative following the first series but fail to tell how many relapsed. Their doses in seven treatments only averaged two and eight tenths grams total.

Corbus of Chicago believes in intensive treatment and in one case gave as many as forty-one intravenous injections of salvarsan. Lane of New Haven is a believer in intensive treatment of syphilis. Wile, Elliot and Schamberg believe in intensive treatment but prefer to give their mercury by inunction. Sachs of New York is an advocate of intensive treatment. Spittel of Ceylon uses arsenobenzol intensively and prefers an intravenous injection of mercury. He injects each week alternately his arsenobenzol and mercury. He calls six injections of each a course. His courses are determined by his Wassermann reactions, which is, of course, fallacious. Balzar of France gives arsenobenzol intramuscularly and has a preparation which he uses with guaiacol and stovaine which he asserts is painless. He gives four courses of sixteen injections each the first year and follows with others for four years. He gives mercury at the same time. Poullard of France uses novarsenobenzol subcutaneously in small doses and states that it is just as rapid as intravenously. He also uses cyanide of mercury both intravenously every two or three days or intramuscularly every two days. His mercury preparation for intravenous use is one per cent. solution of mercury Hg (CN₂) of which he uses one c.c. as a dose. For intramuscular injections he adds a small amount of cocaine to the same prescription and uses it in one c.c. doses every two days. Prochorow has given twenty-five to thirty-five drops of a one per cent solution of cyanide as an intramuscular injection without causing any local disturbances and without any benefit of his syphilitic patients. Chevallier and Dufour use both novarsenobenzol and mercury intensively. Both prefer the benzoate because it is less toxic than other soluble forms of mercury. Lane of Boston follows Pollitzer's rule of one tenth gram 606 for every thirty pounds of body weight; first course ten to twelve injections; first four injections every three days and remainder at weekly intervals in primary cases; mercury in combination and given to toleration for twelve weeks; ten to twelve injections then rest for six weeks. Then he gives the same course over again. Sixty per cent. of the patients became negative within three months. If the Wassermann is

negative after the second course the third course may be omitted but it is safer to give it. This ends the first year and afterwards careful observation clinically and serologically and continuation of treatment if necessary. Schamberg uses ninety hundredths gram neosalvarsan three times a week at first in primary cases and continues at longer intervals. He combines this treatment also with mercury.

The war office treatment is seven injections of 606, totaling two and eight tenths grams, and eight injections of mercury in fifty-six days. If other injections are necessary (as of course they should be) the total amount for the first year was four and six tenths grams of 606 and in succeeding years no more than three or four injections were used over a period of twenty-eight days each year. Scott and Pearson proved that this treatment (as of course it would be) was inefficient and that there was a surprising number of reappearances of oral sores or sores near the primary lesion. Scott and Pearson recommend three injections of 606 in three weeks. Then eight injections of one gr. mercury at weekly intervals. Then one month's rest. Then two injections of 606, eight weeks of mercury and iodide and rest for a month. This treatment might be continued indefinitely and if continued would probably result in a cure, but it would seem as if a more intensive treatment from the start would prove more efficient. Williams of Canada gives intensive treatment and reports seventy per cent. negative with average of seven and one half doses of salvarsan. Hazen in twenty-two patients gave ninety-eight injections of 606, three injections at least in all cases. In one case three courses of three injections were necessary with mercurials. All patients except two were negative to Wassermann.

RECTAL METHOD.

The rectal method of using salvarsan seems to be of value if for any reason the other route is not feasible but absorption is never to be relied upon and larger doses would necessarily have to be used. If activation by the liver is necessary it may prove to be an advantageous method. Wright used it by drop method (Murphy seepage) ninety hundredths gram neosalvarsan in two hundred c.c. of water, fifty drops to the minute. Arujo of Brazil considers the rectal method of value in children. Bogrow of Moscow uses salvarsan in cocoa butter and uses comparatively small doses one tenth or two tenths gram.

The most scientific experiments along these lines have been conducted by another experimenter who checked his absorption via the rectum by the amount of arsenic in the blood serum. He found that in order to approximate the amount of arsenic in the blood following an intravenous injection of ninety hundredths gram neosalvarsan it was necessary for him to use four grams of neosalvarsan in a rectal suppository and by using this every five days he could approximate the results obtained by ninety hundredths given intravenously.

Azemar of Toulouse uses ninety hundredths gram neosalvarsan in water and injects it into the

rectum. The urine examination is checked for arsenic. He found that arsenic increased in amount up to the third day and disappeared by the sixth so that he could keep them, as he calls it, saturated by one injection a week. He adds a little tincture of opium to his injection. In children this may prove to be a valuable addition but it remains to be proved.

The newer preparations like silver salvarsan, for which much is claimed by Nathan and Flehme, because of decreased toxicity and increased therapeutic effect, have not yet been sufficiently tried and are still subjudice. The unfavorable reactions appear to be more numerous than under salvarsan. Sulphoxylate salvarsan is another insufficiently tried agent but seems to be of use in old syphilitic cases. So that it seems to be fairly definitely established that the consensus of opinion is in favor of intensive treatment of syphilis by the use of two drugs and their many modifications, arsenic and mercury.

Intensive treatment seems to mean many different degrees, depending on the individual administrator, but it would seem that observation for at least four years is the opinion of the majority.

At least two courses of six injections of some arsenical preparation are necessary during the first year and these should be intercurrent with two courses of mercury, which should be at least six months in totality for the first year. This should be the minimum. At least one and usually two courses of each should be the minimum for the second year. One course for each year should be the minimum for the third and fourth years. In case of a positive Wassermann reaction persisting, a much more intensive treatment should be used.

THE VALIDITY OF THE WASSERMANN.

The Wassermann is not a specific reaction but for all practical purposes it will serve. It must not be relied upon as an absolute check either upon diagnosis or treatment. There is entirely too much credence placed upon the Wassermann. The Wassermann has been variously interpreted by many writers but aside from failure of laboratory technic, and these are by no means few, we must admit that there are many conditions which, under certain circumstances, will give a positive reaction. On the other hand a negative reaction (aside from laboratory mistakes) is very often recorded even with the most marked forms of active syphilis.

Hudelo of Paris says that it is particularly distressing to obtain a negative Wassermann in four or five out of every hundred cases and to still find that clinically they present the active lesion of syphilis, even roseola mucous patches, and other manifestations.

Octhough says it is not a reliable guide for treatment. There will be a certain percentage of fixed positive Wassermanns but intensive treatment will convert many of these into negative.

One may use the Wassermann as a check as much as one pleases. A Hecht Weinberg or a Gradwohl modification may be used. The spinal fluid may be examined as much as may be necessary but the courses cited above has seemed to be what would or

should constitute a minimum even if all the checks are proven negative. Most syphilitics are too little rather than too much treated and the struggle for a cure is worth all the effort.

INTRAVENOUS AND INTRAMUSCULAR MERCURY.

As we have shown there are many different ways of using mercury and many preparations. Dufour, Chevallier and Bory use benzoate of mercury. Poulard uses cyanide intravenously and intramuscularly. Spittel of Ceylon uses intravenous injections of mercuric iodide. Lane of Boston uses intramuscular injections of soluble salt every two days or insoluble salt once a week. Tauber of Cincinnati

uses intramuscular injections or inunction. Wile, Elliot and Schamberg use the inunction method. Cole and Littman tried calomel inunction and gave the method up because calomel is too weak a salt of mercury and absorption is bad. Rarely did this produce saturation. Bastron uses bichloride intravenously but does not, apparently, advise others to do so because of the danger of thrombosis. Then why does he use it himself? The whole subject of mercurial treatment is a matter of saturation and saturation alone. It makes no difference how it is used or in what particular form it is used so long as that object is attained.

(To be concluded.)

Recrudescence of Visible Syphilitic Manifestations Occurring During Antispecific Treatment

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The usual course of a syphilitic infection which is treated along approved lines is rather uneventful—except in some instances of untoward reactions arising from the drugs used. Under our therapy the active visible lesions disappear leaving the person with only a serological reminder of the disease and a potential susceptibility to certain pathological changes in the viscera, unless sufficient treatment is taken. The chancre will often dry up within twenty-four to forty-eight hours after the first injection of arsphenamine. Condylomata will fade and disappear without leaving any trace of their former presence, after a short period of intensive treatment. Gummata in various parts of the body will melt away, leaving only a scar to denote their former presence.

The frequent clinical observation of the extreme efficacy of only a few injections of arsphenamine and mercury has, I believe, made us too sanguine as to the potency of these drugs. We ascribe to them a spirocidal power which other experiences show they do not fully deserve. Certainly, we all recognize the error of the earlier conceptions, of the great and complete sterilization powers of only a few injections of arsphenamine. We now recognize that this substance while killing off a large number of the spirochete, leaves many behind which later proliferate. Repeated fractional sterilization of the system (as exemplified by our courses of treatment) has therefore become the present accepted method of best dealing with the syphilitic infection.

Persistent vigorous treatment is necessary in order to keep the infection under control. The following cases illustrate the recrudescence of acting syphilitic manifestations resulting from insufficient treatment or during its course.

CASE I.—No. 4159. A. I., aged thirty-one, presented himself at the Mt. Sinai Dispensary, March 4, 1921, complaining of a sore throat and penile sores. He admitted having had a chancre two years

ago, while with the British Army in India. He was at that time given three intravenous injections of arsphenamine and nine intramuscular mercury injections. His Wassermann test was reported positive at the time. No treatment had been taken since then. The patient presented several moist condylomata on the shaft of the penis. There was also a scar on the shaft, which the patient identified as the site of his primary lesion. There were mucous patches on both tonsils. The Wassermann was four plus. The patient was put on vigorous antisiphilitic treatment (mercury salicylate intramuscularly and arsphenamine intravenously) and the penile sores quickly disappeared. The tonsil lesions improved more slowly and are now practically healed.

Comment.—This case is one of insufficient treatment in the early stage with the development later of secondary active lesions. These lesions were very virulent and contagious.

CASE II.—No. 4458. H. B., aged twenty-four, presented himself at the Mt. Sinai Dispensary January 31, 1921, with a sore on the ventral surface of the shaft of the penis. The lesion was a condyloma about the size of a dime, and had been present for a week. The Wassermann reaction was four plus. The patient gave a history of having had a chancre nine months ago, and his Wassermann test was positive. He had been given eleven arsphenamine and twenty-four mercury injections by a private physician—the last about three months ago. Under regular antisiphilitic treatment his condyloma quickly disappeared. No new lesions have been noted since then.

Comment.—Here the treatment was not at all insufficient—as the number of injections were certainly ample. In the three months interval, however, during which the patient received no treatment, an active secondary sore appeared.

CASE III.—No. 4490. H. G. presented himself at the Mt. Sinai Dispensary on February 14, 1921,

with a lesion about four cm. by two cm. on the right buttock near the anus. He gave a history of having acquired an intraurethral chancre in January, 1920, while in Bavaria, where he was given eight intravenous injections of arsphenamine and a course of mercury inunctions. He had received no treatment for the past eight months. The present lesion was present for the past ten days. It was a typical flat condyloma. The patient had moderate general adenopathy. The Wassermann reaction was four plus. He was put on regular antiluetic treatment and the lesion disappeared within three weeks.

Comment.—Same as in Case II—development of a secondary lesion eight months after the last arsphenamine injection.

CASE IV.—C. M., aged twenty-four, presented herself for examination on January 18, 1921, on account of a right inguinal swelling. The right inguinal glands were hard, enlarged, and not tender. No primary lesion was visible. There was a faint macular eruption on the trunk and extremities. The Wassermann reaction was four plus. Under vigorous antispecific treatment the adenitis and eruption disappeared. After having received eight arsphenamine and twelve mercury injections, the patient began to complain of a sore throat and dysphagia on April 17, 1921. The left tonsil was considerably enlarged and reddened and an ulcer about one cm. in diameter was seen just above the tonsils on the soft palate. The ulcer was believed to be a gumma since smears for Vincent's angina were negative. Potassium iodide minims fifteen three times a day were ordered and two more arsphenamine and a few more mercury injections were given. The ulcer promptly healed and the tonsillar enlargement subsided.

Comment.—Here we have a syphilitic ulcer developing during the course of approved treatment—in spite of treatment considered adequate according to present conceptions.

CASE V.—No. 4456. J. B., aged twenty, presented himself at the Mt. Sinai Dispensary January 14, 1921, with a history of having had a chancre in October, 1920. No secondary manifestations were noted. The epitrochlear and postcervical glands were enlarged. The Wassermann reaction was four plus. He was given the usual antisiphilitic treatment. After his second arsphenamine injection, he began to complain of severe pain in the left eye. He had an iridocyclitis which was considered syphilitic by our ophthalmologists. He received further intensive treatment and the eye condition rapidly improved. At present there is a marked irregularity of the pupil.

Comment.—Here we have a syphilitic iridocyclitis developing in the early course of treatment, and promptly subsiding under further treatment.

Many physicians believe that in early syphilis the patient is a source of danger to the community only as long as active cutaneous or mucous membrane lesions are present, and that the person becomes harmless as soon as such lesions disappear. It is believed that further treatment concerns only the individual infected, since that person alone will suffer from neglect which may be elected. Essentially this opinion is correct—since most syphilis infec-

tions result from intimate contact with open lesions. The mistake lies, however, in believing that after only a few injections of arsphenamine and mercury such infectious lesions are permanently banished. Relapses are not infrequent and the infectiousness of the recurrent lesions is not to be denied. We dare not be sanguine as to what may be considered sufficient treatment, or prematurely discharge a patient with a clear conscience as to his innocuousness. A patient is often potentially a source of contagion far longer than we imagine, and should be so informed. Late secondary lesions are not uncommon—especially in cases where treatment has not been persistent. The physician who treats his early syphilitic patients sporadically (with an infrequent injection of arsphenamine and an occasional injection of mercury) is negligent in his duties to the public.

DEVELOPMENT OF SYMPTOMS DURING TREATMENT.

Occasionally, one is chagrined by the development of active manifestations during treatment (Cases II, IV, V). The reason for their development is still unknown. Are we to regard them as accidental manifestations of a phenomenon which occurs frequently in a milder degree, and which usually passes unrecognized? Are such occurrences frequent in the internal organs hidden to our observation and manifested by vague subjective symptoms which are usually overlooked and often misunderstood? Or are they an unusual phenomenon due to highly virulent spirochete—organisms made more virulent and more highly resistant, through being stirred up by the treatment directed against them? The less resistant spirochete, or those most exposed through their position with relation to the blood stream, are no doubt killed by the arsenic and removed from the body by the proper agencies. There are some spirochete, however, which become resistant to the drugs directed against them—the ordinary doses being sublethal to them. They may be only irritated by the therapeutic agents, and aroused to greater activity, cause recurrences in this or that organ.

It is of course obvious, that dosage is of extreme importance in the management of any case. The factors to be considered are, the severity of the infection, and the resistance of the individual. Larger doses of arsphenamine and mercury will undoubtedly be of greater potency against the parasite, but at the same time be more toxic to the host. An infection which will be easily controlled in one instance by usual doses, may prove recalcitrant in another instance. If the dose be too large, toxic manifestations arise (nephritis, hepatitis, vomiting, neuritis, dermatitis, etc.). If too weak, the drugs will not have its full spirocidal action, and may stir up the invading parasites to greater activity.

CONCLUSIONS.

In conclusion it should be emphasized, that a patient with an early syphilitic infection is not rendered innocuous by a few injections of arsphenamine and mercury. Active lesions may recur even while the patient is under apparently adequate treatment. Thus it is important to be persistent in treatment if we wish completely to eradicate the infection, and sterilize the host.

957 SIMPSON STREET.

Unilateral Nephritis*

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It is not without a certain feeling of fear and trembling that I venture to present this paper, for I well realize that one gets into rather deep water very quickly in discussing this subject, and any person with attainments no greater than I possess might easily get beyond his depth. However, this paper is largely speculative, I trust perhaps suggestive, and makes no pretence at being conclusive. In order to make myself clear, I shall state my premises at the outset and then make an effort to defend them.

I believe that there are certain pathological lesions which occur in the kidney, which present a fairly definite group of clinical phenomena and which are usually spoken of as nephritis for want of a better term, that are not nephritis at all, at least not as we ordinarily interpret the term nephritis. I further believe that these lesions, in at least some of these cases, represent the scar of a previous inflammatory condition caused by a remote focus of infection, and that these lesions may occur as a localized process confined to part of the kidney tissue, or as a diffuse process involving the entire renal stroma and indirectly involving the bloodvessels, glomeruli, and tubules.

Clinically these cases present themselves in two groups which in my opinion definitely overlap. These groups are first, the cases of so-called idiopathic renal hematuria about which there has been so much in the literature of the last twenty years; and second, the chronic aching kidney, which is rather vaguely mentioned in some of the older textbooks but of which little has been written in recent years. When I say that these groups overlap, I might go farther and say that, in my opinion, they are all one. In my experience all bleeding kidneys at some time or other between the periods of bleeding, ache; and while not all of the aching kidneys that I have seen have presented the symptom of hematuria, I feel that if followed over a sufficiently long period of time, that they would.

The bleeding kidneys have for many years furnished, and continue to furnish, a prolific source of discussion, investigation, and speculation; and the end is not yet. Many of the older writers spoke of these cases as being cases of renal epistaxis or renal apoplexy in which there was no demonstrable lesion in the kidney, in fact, in a few cases which came to operation or autopsy no very definite lesions were found. Fenwick, and later Pilcher, wrote of renal varix as being the pathological lesion in some instances. I have never seen or recognized such a condition, and while of course I do not doubt their existence, I do not believe that they represent a fundamental pathological condition. Young, of Boston, in a paper read before the American Urological Association last year, based upon the study

of quite a large group of cases occurring at the Massachusetts General Hospital, felt that much confusion had arisen as a result of attempting to place all these cases in the same category, and concluded that a variety of lesions might well present the same clinical picture; such, for example, as lesions of the papillæ, the lining membrane of the renal pelvis, or even the ureter. His findings and conclusions seem perfectly logical, but of course there are still a considerable number of cases in which the lesion is in the kidney tissue and in which the pathological condition is vague. O'Neil, in a recent paper read before the New York Urological Society, analyzed a group of cases also occurring at the Massachusetts General Hospital and, as I understood his conclusions, felt that many of these cases were cases of nephritis which might or might not be unilateral and that the opposite kidney might later show signs of involvement. He sounded a warning against radical surgery. Young, in a more recent paper, suggests a pre-nephritic state as being the cause of the trouble.

We hear much less about the second group of cases, and yet it seems to me that they occur as a fairly definite clinical entity. A considerable number of patients apply for treatment at my clinic, and surely similar cases must apply at other clinics, presenting, briefly, the following clinical picture: There is a dull aching pain which has existed for a few months or a few years, referred to the loin, occasionally radiating along the course of the ureter, and accompanied by occasional periods of slight bladder irritability. The pain is never severe but has occasional slight exacerbations and interferes sufficiently with the patients' comfort to make them apply for relief and to be willing to submit to all sorts of manipulations to this purpose. We have been very careful in all these cases to exclude, so far as we were able, all the more common lesions, extrarenal and otherwise. The objective signs are conspicuous in rather a negative way. There is usually some tenderness over the affected kidney elicited by deep pressure and heavy percussion. In two of my patients this symptom was rather prominent. Cystoscopically the bladder appears normal. In a few cases I have noticed a slight edema about the ureter orifice. The urine is normal, sterile, and free from abnormal elements, including casts. This latter point I wish to emphasize. The phthalein output may be slightly diminished, although more often it is normal and equal with its fellow. The x ray may show the kidney somewhat larger than the one on the opposite side. The pyelogram may, and sometimes does, show slight irregularities. This is, of course, difficult to interpret for the reason that the normal presents such a wide variation. In the majority of cases, however, the pyelograms have appeared to be normal. These findings in my experience are identical with those noted in the cases of bleeding kidney examined in the intervals between attacks of hematuria, and I repeat, all the cases of

*Read at the New York Academy of Medicine, Section in Genitourinary Diseases, April 20, 1921. (From the Urological Service of the Brooklyn Hospital.)

bleeding kidneys that have come under my care, have ached.

There are a number of reasons why the pathological conditions of these cases is not better understood. One very obvious reason is lack of material

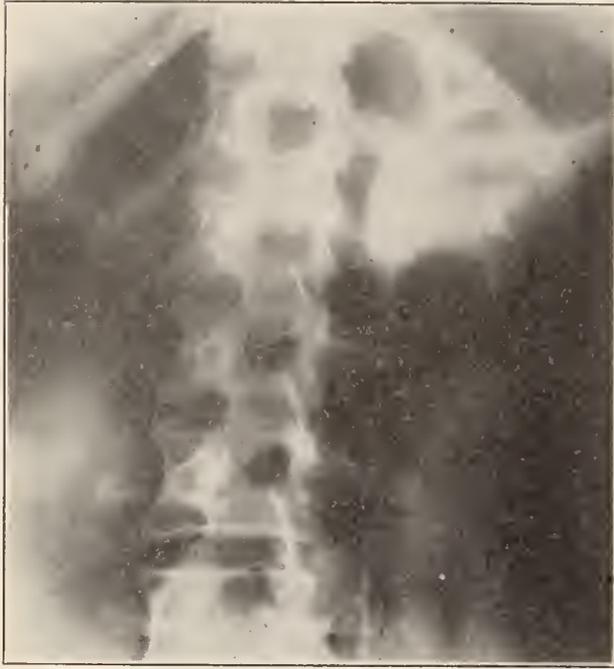


FIG. 1.—Showing filling defect in pelvis with apparent elongation of upper calyx.

for careful study. Relatively few of these patients are submitted to nephrectomy, and not a few that are, have been operated upon during an attack of bleeding when the picture is somewhat blurred by the superimposed acute condition, and, naturally, the opportunity is seldom presented of following these patients to their eventual demise, perhaps from some independent disease, and making a careful autopsy. Moreover (and right here I realize that I am treading upon dangerous ground), I do not believe that the pathologists have yet learned to recognize some of the fine variations in renal pathology. On the whole, it has always seemed to me that the variety of lesions which may occur in the kidney are bewildering at the best; many of the so-called medical nephritides seem reasonably well established as definite pathological entities with a fairly definite clinical syndrome attached to each of them. Even here some of these conditions would appear to be a renal expression of a general constitutional disease, such, for example, as the interstitial nephritis occurring as a part of a general cardiovascular disease. It is rather a trite statement, to say that we still have much to learn about renal pathology and renal physiology, especially when considered in close relation to clinical phenomena. To illustrate, I have in mind two acute conditions presenting vastly different clinical pictures and yet very similar renal lesions. I refer to cases of acute parenchymatous, desquamative nephritis, such as may occur complicating some of the exanthemata or subsequent to sudden exposure to cold, and poisoning from a large dose of bichloride of mercury. In the one instance

we have pyrexia, edema, oliguria, headache, convulsions, coma, and all the obvious signs of a pending uremia, while in the other instance the patient may go on for several days with no obvious manifestations other than the oliguria or anuria until within a few hours before death, and then dies quickly from a pulmonary edema. However, this is aside from the point and is merely a part of my speculation. At any rate the cases under consideration do not present the clinical picture of nephritis as we understand nephritis. They do not have edema, they do not have disturbance in their blood pressure, they do not have gross disturbance in the functional capacity of the kidney or kidneys, they are not uremic or preuremic. They do have pain, and they do bleed. These latter symptoms are certainly not common symptoms of the ordinary chronic nephritis. Perhaps, as Young says, these are pre-nephritic lesions, and if they are followed long enough they will eventually present other symptoms which go to make up the clinical picture of nephritis.

Eleven of these cases have come to operation at my hands, and they have in part formed the basis of my speculations and of this paper. Six patients were subjected to nephrotomy, one to simple decapsulation, and one case with slightly movable and ptosed kidney, to decapsulation and nephropexy. These were all pain cases. The two decapsulations were entirely relieved of symptoms. In four of the nephrotomies the patients were apparently cured, the other two were temporarily relieved but pain recurred in a few months, in one instance as bad as before operation. The other patient feels that he is better but still has considerable discomfort. Three patients were subjected to nephrectomy for one rea-



FIG. 4.—Showing poorly filled pelvis and calyces. This pyelogram was repeated on several occasions and always found the same.

son or another, and these cases I wish to report in some detail with comments. Before proceeding to the report of these three cases, I wish to report one other case which, while not belonging to this group, I believe has some bearing upon it.

CASE I.—P. L., male, aged thirty-seven, single, motorman. Admitted to my service at the Brooklyn Hospital May 13, 1920, with the following history in brief: Three years ago he had a severe pain in the left loin radiating to the groin, accompanied



FIG. 2.—Section made from kidney of Mrs. E. Low power, below; showing above, relatively normal kidney; affected area.

by bladder irritability and cloudy urine. This attack lasted two weeks. He apparently made a complete recovery and was well until a year ago when he had a similar attack also lasting about two weeks, another attack three months ago, and again three weeks ago, this last attack being accompanied by chills and fever.

General examination presented no findings of special interest except a well marked pyorrhea. The left kidney was palpable, appeared slightly enlarged, and was definitely tender. The bladder urine was turbid and loaded with pus cells and colon bacilli. Cystoscopic examination revealed a moderate, diffuse congestion of the bladder mucous membrane, and there was a slight edema about the left ureteral orifice. A No. 6 catheter passed readily to the kidney pelvis on each side, and urine flowed in normal rhythm. The urine from the right kidney was normal while that from the left side contained an abundance of pus cells and culture showed colon bacilli. Intramuscular phthalein appeared in six minutes on the right side and in fourteen minutes on the left. A radiograph showed a moderately large left kidney; the pyelogram was negative. Operation on May 14, 1920, revealed a moderately enlarged kidney which appeared normal in every other respect except that on the anterior surface about the middle of the kidney there was a small fluctuating area. A small incision over this area evacuated about one c. c. of greenish yellow pus, leaving a small but definite abscess cavity. Cultures from this pus remained sterile. I have a feeling that we should have recovered *Bacillus coli* from this pus, but we did not. The wound was closed with a small drain down to the small nephrotomy incision. The patient made a good recovery and at present he is free from symptoms, his urine is clear and sterile. Now for speculation: In the first place

I have a feeling that this patient would have become well without an operation providing a perinephritic abscess did not develop. Now suppose that the abscess had been considerably larger, as it might have been, suppose it had been in the medulla instead of the cortex, and suppose that it had ruptured and drained as it might have done, into the kidney pelvis, with spontaneous recovery of the patient. In such a case one wonders what would have been the ultimate fate of that particular area of kidney tissue which had been the site of the abscess.

CASE II.—The next case which I shall report briefly suggests to me one possible answer. W. E., female, aged thirty-five, married, admitted to the Brooklyn Hospital December 13, 1917, with the following history:

Beginning three years ago, for a period of one year she had been troubled with slight bladder irritability and was obliged to urinate once or twice at night. Two years ago she had a profuse hematuria lasting four days, accompanied the last two days by severe colicky pains referred along the course of the left ureter and caused no doubt by the passage of clots. I saw her at this time and was able to demonstrate cystoscopically that there was blood coming from the left kidney. Following this attack she was restored to perfect health except for a dull aching pain which was referred to her left loin and which remained fairly constant up to the time of her admission. Oddly enough, following the hematuria, her bladder irritability entirely disappeared. The day before admission she again passed very bloody urine. Cystoscopy on December 14th showed a blood clot protruding from the left ureteral orifice, urine from that side was very bloody, while the urine from the right kidney was normal. She was

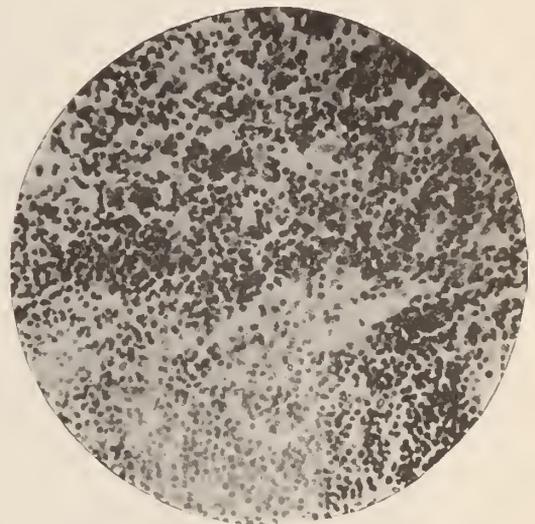


FIG. 3.—High power of area shown in Fig. 1.

kept in bed with no other treatment than light diet and forced fluids, and the bleeding promptly subsided. Cystoscopy was repeated on December 20th. At that time the urine was clear, the bladder and urethral orifices normal. Intramuscular phthalein was excreted by the right kidney in eight minutes, by the left kidney in nine minutes. The urine from each side was free from all abnormal elements and was

sterile. The x ray showed a slight enlargement of the kidney and the pyelogram showed an apparent filling defect between the upper and middle calyces (Fig. 1). A diagnosis was made of renal tumor and nephrectomy was proposed and accepted. At opera-



FIG. 6.—Section from medulla of kidney in Fig. 5 showing cyst filled with blood.

tion when the kidney was delivered upon the loin, it appeared perfectly normal except for moderate enlargement. The kidney was split, and an area about an inch in diameter was noted near the middle of the kidney which differed markedly in color and density from the surrounding tissue. It was darker, much firmer, and the normal kidney markings were blurred or absent. Nephrectomy was performed and the specimen submitted to the pathologist. He reported the area involved as being made up entirely of small round cells and made a diagnosis of sarcoma. This diagnosis was confirmed by another pathologist and the case was reported in good faith before this section as one of small round celled sarcoma of the kidney. The patient made a good recovery and is in perfect health at present writing. About a year later, feeling some doubt about the diagnosis, I brought out the slides and submitted them to two other pathologists, each of whom said that the cells were lymphocytes and represented a low grade inflammatory process. I am confident that the latter diagnosis is the correct one. Now for further speculation: I am satisfied that the nephrectomy in this case was uncalled for. If this patient's kidney had been spared one wonders what would have happened to the area of small round celled inflammation and once again one possible answer is suggested in my next case.

These cases are not presented in the order in which they applied for treatment but they represent a natural sequence of events which might have occurred in one kidney.

CASE III.—H. J., aged twenty-nine, single, teamster, came under my care in the fall of 1915, complaining of pain for the past three years which he describes as a dull aching pain referred to the left loin and occasionally radiating along the course of the ureter. This pain was gradually getting worse and was severe enough to prevent him from work-

ing. He had no bladder symptoms. This patient was studied over a long period of time and repeated examinations were made. With the exception of marked tenderness over the affected kidney no objective signs were elicited at any time. The patient persisted in his demands for relief and willingly submitted to numerous cystoscopic examinations, so that exploratory incision was finally decided upon and performed. At operation the kidney appeared a little large, otherwise normal until it was split. On section an area rather more than an inch in diameter was noted, definitely hard in consistency and paler than the surrounding tissue, not so well localized as the area noted in the preceding case, but gradually shading off into normal tissue. We did not feel that the evidence presented warranted nephrectomy, and the nephrotomy wound was closed with mattress sutures in the usual manner. On the following day he had a very severe hemorrhage which apparently subsided with strapping, morphine, etc. He went along very well until his seventh day, when he had another very severe hemorrhage which continued in spite of all conservative measures and demanded nephrectomy as a lifesaving procedure. Following this there were two or three rather critical days, after which he went on to a smooth recovery and remained in good health up to two years ago, when he was last heard from. This man was entirely out of luck, but we were fortunate in securing an interesting specimen. The pathologist in this case reported the area involved as being practically a scar. The bloodvessels and tubules were contracted and plugged and practically replaced by fibrous tissue.

These last two cases show a definitely localized lesion, while the next case shows a diffuse lesion and represents quite a different pathological state. At this point I might say that I have at various times discussed this whole matter with our pathologist,

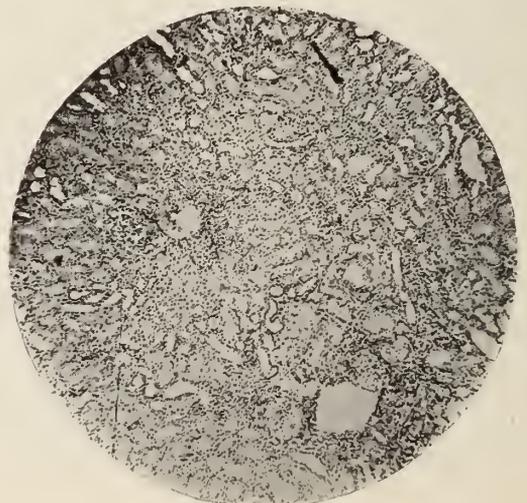


FIG. 7.—Section from cortex, sclerosed glomeruli and blood-vessels. This section looks more like a glomerular and vascular nephritis.

Dr. James Denton, whose opinion and judgment I profoundly respect, and while he supports, or at least does not refute my ideas on the local lesions, he affords me small comfort in my views concerning the diffuse lesions.

CASE IV.—M. F., aged forty-four, widow, was admitted to my service at the Brooklyn Hospital on December 15, 1919, with the following urological history: For the last seven years she had a dull aching pain in the left loin which occasionally radiates to the left groin. During the past year she had three attacks of profuse hematuria which in each instance were traced to the left kidney. For the past three months the pain in the loin has been much worse, and has been severe enough to confine her to her home most of the time and to her bed part of the time. A cystoscopic examination made on July 12, 1919, about a week after one of her attacks of hematuria, presented the following findings: There was a stricture of the urethra which was readily dilated; except for a mild congestion of the trigone the bladder was normal; there was some edema about the left ureter orifice; catheters passed readily to the kidney pelvis on either side; phthalein appeared on each side in nine minutes, and in equal volume; the urine from each side was normal, free from casts, and sterile; urea, right, 16.48; left, 16.23; guineapig test was negative; the Wassermann test was also negative and the blood chemistry was normal.

Cystoscopy was repeated on December 17, 1919, and the findings were identical with those of the previous examination except that a few pus cells were noted in the urine from the left kidney. Cultures, however, were sterile. The x ray showed some enlargement of the kidney. The pyelogram showed a somewhat irregular distorted kidney pelvis (Fig. 2). Operation, December 23, 1919. The kidney was somewhat enlarged, the contour somewhat irregular. The surface has a somewhat lumpy appearance due to a number of small cysts which can be seen and felt directly under the capsule. The kidney was split, and on section there were noted, scattered throughout the kidney a number of cavities varying in size from that of a pinhead to that of a large pea. Nephrectomy was performed (Fig. 5). The patient is well and free from symptoms to date. Following is Dr. Denton's report on the specimen removed:

Case M. F., left kidney. Pathological diagnosis: Moderately advanced vascular and glomerular nephritis. This kidney examined in 1919 and reported as early chronic interstitial nephritis. New blocks cut for paraffin embedding for more comprehensive sections. There were two sections of the kidney which reconstruct a considerable portion of the cortex and medulla. The capsule was wanting as it had been stripped off. The general topography of the kidney was not greatly altered, though small

areas of connective tissue formation about the blood-vessels were quite striking, as well as several small cysts, one or two of which were filled with blood. In the cortex, scarred glomeruli, and some enlarged glomeruli with thickened capsules, thickened smaller vessels and small islands of lymphocytes with a small amount of fibrosis, were the chief lesions. There

were some degenerated tubules and dilated tubules containing hyaline casts. Passing toward the pelvis and the ureter, the fibrosis becomes somewhat more marked, the vascular lesions were the same, and the tubules somewhat less degenerated.

The lining of the pelvis shows a little thickening but no inflammatory reaction was present. The whole appearance, gross and microscopic, of this kidney did not suggest local infection, but rather the vascular and glomerular

type of nephritis, where the cause is not known. Considerable functionally active kidney still remained (Figs. 6 and 7).

While of course I must defer to Dr. Denton's opinion, I am free to confess that this specimen does not conform to my conception of an ordinary nephritis. At any rate it does not check up with the clinical picture. Dr. Denton admits that the process is moderately well advanced, and it would seem logical to assume that a moderately well advanced nephritis should show some disturbance in its functioning capacity. It is certainly not an early or pre-nephritic condition. Is it unreasonable to assume that such a condition might have been caused by a diffuse inflammation of the kidney stroma, call it what you will, cellulitis of the kidney perhaps, with a secondary involvement of the tubules and glomeruli?

One link in the chain is missing: we have not located in any of these cases the remote focus of infection. This may have been transitory and easily missed. The pediatricists well know that many cases of obscure pyrexia in infancy which a few years ago went undiagnosed are now readily recognized as cases of pyelitis. We are all familiar with the fulminating type of lesion described by Brewer, which in every instance can be traced to some remote lesion such as an infected tooth, tonsil, finger, or some other region. Is it unreasonable to assume that less virulent infections may occur and recover spontaneously, leaving scars to produce symptoms months or years later?

I realize that neither my material nor the weight of my arguments is adequate ground upon which to base conclusions. However, they have in the last few years provided me with much interesting and entertaining speculations on an obscure group of cases.

67 HANSON PLACE.



FIG. 5.—Kidney shows marked thickening of pelvis with numerous small cysts scattered through kidney substance. Some of the areas showing lesion the best have been removed for section.

What the General Practitioner Should and Must Know About Kidney Diseases

By HENRY HALPERT, M. D.,
Scranton, Pa.

Of all the excretory organs of the body, the kidneys are the most important, and in proportion to their importance is the danger of their suffering injury, often of a very serious nature. It must be kept in mind that the kidney is a highly complicated mechanism, composed of a series of units of secretion, each consisting of a glomerulus with an attached tubule—parenchyma—surrounded by blood-vessels and connective tissue. Each of these units may become diseased quite independent of its neighbors. Hence it can easily be imagined how much variation is possible in any clinical or pathological picture. The clear understanding of renal disease is rendered still more difficult by the fact that after being injured the organ may gradually recover, even though this process of recovery takes many years, and it is quite possible that neither the patient nor his physician will even be aware of either the original lesion or the course of the healing process. Only in a general way can one picture the extent of a kidney lesion by clinical observation. A number of methods of examination must be combined before one can obtain sufficient information. There must be a minute and careful history supplemented by a thorough, general, physical examination; the röntgen ray and the cystoscope must come to our aid, and the laboratory help us with blood examinations, in addition to all the usual and established urinary tests.

Renal disease may be suggested by the patient's history, if he relates some early kidney disturbance of which he was aware, or tells of suggestive symptoms, such as headache, visual disturbance, shortness of breath, and swelling of the extremities. If the existence of renal disease has been accidentally discovered, when, perhaps, the urine was being examined with some other purpose in view, it is often very helpful to obtain a history of some acute affection through which the patient has passed, such as scarlet fever, diphtheria or measles, as these diseases are often followed by kidney disturbances. When making the physical examination it is well to remember that the blood pressure reading is not necessarily an indication of the severity of the renal condition. Such signs as enlargement of the heart, exudate or hemorrhage in the eye grounds, or choked disc may, however, serve to give the examiner a better idea of the extent of renal damage.

The x ray will tell a good deal about the size of the kidney and whether calculi are present. If the renal pelvis can be injected with some shadow throwing substance, distortion of the pelvis caused by kidney disease will appear in the röntgenographic picture. The cystoscope will reveal in which kidney the disease is present and help to establish what kind of trouble we have to deal with, also showing the relative functional ability of the two kidneys.

Blood examination is chiefly useful in determining whether the function of elimination is being fully

performed by the kidneys. When the blood stream contains a high percentage of nonprotein nitrogenous bodies or of their constituent urea, ammonia, uric acid, creatin and so on, we have evidence that the kidney is not "on the job." Under normal conditions there are less than twenty milligrams of urea nitrogen in one hundred cubic centimetres of blood. Variation in diet may alter this proportion a little, but it remains fairly constant so long as the kidneys work properly. Some observers believe the estimation of the amount of chloride of sodium in the blood is also valuable, as certain types of renal disease seriously interfere with sodium chloride elimination.

Urine examination is, of course, the classical means of detecting kidney trouble and of watching its progress after discovery. Such examination should include a test for the presence of albumin and inspection of the urinary sediment. The presence of albumin is no sure proof that the case is one of renal disease. It may be caused by a pathological condition in some other part of the urinary tract. In the examination of the sediment the presence or absence of casts, red blood corpuscles, leucocytes, epithelial cells, bacteria and fat droplets should be established. Red blood cells usually indicate some acute process or tumor and the leucocytes signify an acute inflammation.

In health more urine is excreted by day than by night, and the specific gravity of different daytime specimens will vary as much as ten points. The total amount of nitrogen excreted should closely approach the whole nitrogen intake, and the same is true of the total excretion of sodium chloride.

When renal disease exists the amount of urine excreted at night may exceed that passed during the day; the specific gravity may remain practically identical all the time, being either at a low level or at an unusually high one. At just what point in the different tests the variation in the normal turn into evidence of disease in the kidney it is difficult to say in any individual test. The opinion is formed in regard to the presence of renal disorder from the whole picture.

Lesions in the kidney may arise from a variety of causes. Acute toxic nephritis results from the injuries produced by toxins reaching the kidneys either by the action of bacteria directly upon the organ, or else because bacterial action elsewhere in the body has produced toxins—as in acute infections like scarlet fever or diphtheria—which are then conveyed to the kidneys for elimination. Chemical agents may have the same effect, and certain poisons may be formed during pregnancy "associated with the phenomena known as anaphylactic shock." Acute toxic nephritis can appear after almost any acute infection or in the wake of the ingestion of nonbacterial poisons.

The usual symptoms are a general feeling of malaise, headache, vomiting, puffiness of the face, and dyspnea on exertion. The urine is scanty and dark colored. Fever is sometimes present, and edema frequently, although it is by no means invariable. Blood is a constant finding in the urine in acute nephritis, but that alone cannot establish the diagnosis. When due to the active presence of an infective agent in the kidney, acute nephritis will present a picture typical of any acute infection.

Drugs are of little use in the treatment of this condition. Complete mental and physical rest are absolutely essential. The diet should be planned so as to keep the protein and salt intake as low as is consistent with maintaining the patient's strength. The success of the treatment will in a large measure depend upon the skill and ingenuity of the dietitian in charge. There is considerable difference of opinion in regard to the amount of fluids such a patient should be allowed. If the kidneys do not excrete water well, it would appear reasonable to relieve them of it as much as possible, but as it is also desirable to keep the toxins in a diluted state, unless marked edema exists, it would seem wiser not to restrict the fluid intake too much. As we have no very precise knowledge on these points it is probably best to keep the fluids down to eight hundred or one thousand c. c. if edema is marked; where there is little or no edema the amount may be increased to that usually taken in health.

The labors of the kidneys may be lightened by encouraging other methods of elimination, sweating may be induced by hot packs and elimination by the bowel increased by giving salts as a cathartic, since they attract fluid from the body into the intestines.

Bright's disease, which is in reality a chronic toxic nephritis, has often been so loosely distinguished that a good deal of confusion has arisen between the clinician and the pathologists' understanding of the condition so designated. It may be due to a preceding acute nephritis, or to the long continued action of some poison introduced into the body or originating within it. The lesions may be scattered and cause few general symptoms, or they may involve large related areas of the kidney tissue.

Chronic toxic nephritis usually follows an acute nephritis in patients from fifteen to thirty years old, although it may occur at any time of life. Edema is usually distributed throughout the subcutaneous tissues, especially of the face, and there is a pallor out of proportion to the degree of anemia present. Stale breath and a coated tongue are usually in evidence. The urine is loaded with albumin and hyalin and granular casts, epithelial cells and fat droplets are numerous. Kidney function will be sure to be impaired.

Quite different from this clinical picture is that presented when vascular disease has caused a slowly progressive destruction of the renal tissue. The patient is usually past fifty, and may have harbored the disease for years without being aware of it. There is no edema, but the blood pressure is high, for the arteries are sclerotic, and the heart hypertrophied. The urine is usually plentiful and of low specific gravity, and casts, pus cells and blood cells are often few, or lacking altogether. Ordinarily

kidney function will be shown to be diminished.

Between these two extremes of chronic toxic nephritis we will find all sorts of gradations and combinations of symptoms. Changes in the patient's condition may be very slow, or the disease may progress rapidly. As renal insufficiency increases uremia will usually develop. Uremia may occur in chronic nephritis when the pathological condition is largely interstitial, without the presence of albumin and casts in the urine. Mild uremic attacks may not be fatal in chronic nephritis—all the symptoms of uremia may cease, and the patient long be free from them, although ordinarily they will again recur until the fatal issue. In acute nephritis, even a severe attack of uremia with convulsions and coma may not be fatal, though when chronic nephritis has long been present, and the patient has had repeated slight attacks of uremic symptoms, when true uremia finally develops, there is little hope.

The symptoms indicative of uremia are: hypertension, headache, frontal or occipital, restlessness, though sometimes apathy and somnolence, blurring of vision, ringing in the ears, uriferous odor of the skin and breath, dyspnea, and finally coma and convulsions. A diminished output of urine usually accompanies these symptoms, although this may not always be true in contracted kidney. The treatment for uremia is practically the same as that recommended for severe nephritis. At first the patient's diet may be reduced to the vanishing point of a pint of milk daily, but if his strength is to be maintained he cannot long be held to such strict limitations.

Not infrequently the practitioner will encounter an acute nephritis concurrent with the chronic form. Under these conditions it is very difficult to decide whether the disturbance in function is due to the chronic or the acute process, or even to judge whether or not the chronic condition preceded the acute attack. The history or some clinical evidence like hypertension or hypertrophy of the heart, may help to establish the previous presence of chronic nephritis.

The treatment of chronic kidney disease is in general the same as for acute forms, except that it must be imposed upon the patient as a life sentence. Therefore the diet cannot be so strict as for the relatively brief period of an acute nephritis. The appetite may be allowed to guide the amount of food ingested so long as the weight does not vary. An ambulatory patient should drink from eight to ten glasses of water a day, but keep away from alcohol, tea and coffee. He should eat sweet butter and avoid all spiced and salted foods. Very little salt should be added to cooked food. He should eat meat but once daily, and be restricted to a single egg and never drink above a quart of milk. If the patient is a heavy smoker I generally allow him three mild cigars a day, but must smoke only half of them and the rest throw away as I find the second half of a cigar more injurious than the first half.

Rest should be insisted upon, even at the cost of a change of occupation. The patient and his physician can best decide how this can be obtained in any given case. Absolute inactivity is seldom necessary, but the strenuous life must always be permanently abandoned.

It is hardly possible for me to touch upon the various specific diseases to which the kidney is subject. It may be invaded by the gonococcus or colon bacillus by ascension through the urinary tract from the bladder, or be subject to an acute streptococcic, pneumococcic or staphylococcic infection. Urine examination and functional tests will usually give some clue to the amount of injury the organ has sustained, and the treatment must be that ordinarily used to combat any such infection. The kidney may become involved in a tuberculous process of the urinary tract; indeed it is probable that it may be the original focus of infection, though this is practically impossible of diagnosis until the process has spread and tuberculous kidney is in practice never an entity which can be separately considered.

There is much obscurity surrounding the subject of syphilis of the kidney. Acute nephritis occurring in the course of a syphilitic infection is still thought by many to be due to the effects of the mercury and arsenic used in treating the luetic infection. Other observers have succeeded in clearing up the renal condition by pushing the antisiphilitic treatment still further.

It has been estimated that one woman in five has a movable kidney, most of which never give rise to any symptoms whatever. The right kidney is more prone to prolapse than the left but occasionally both kidneys may be movable. Under normal conditions the kidneys are slightly motile and the right lies a little below the level of the left one. If the fat on which these organs depend largely in order to maintain their position is lost, this support is of course removed, and even a slight strain is likely to displace them. When the corset is worn loose below the waist and tight above, or when it is removed entirely and excessive dancing indulged in, as is now in vogue, loosened kidneys probably occur more frequently.

A floating kidney is usually easily diagnosed by palpation, but if it gives no symptoms it is much better left alone. When it gives discomfort to the patient various methods of relieving the symptoms have been employed. The organ may be carefully

replaced and an attempt made to hold it in place by a suitable pad. If the patient's weight can be increased sufficiently the floating kidney may be permanently anchored by an increase of the perirenal fat tissue. The results of operative intervention have not been very satisfactory.

Nowhere does the general practitioner encounter kidney complications so often as in his pregnant patients. The need of continued uranalysis during pregnancy is too universally understood to need emphasis here. When the patient is pregnant nephritis may occur from any of the causes inducing this condition in nonpregnant women. Gestation may also reactivate an old nephritis which has been supposedly cured. A careful history is of the utmost importance in these cases. If a woman has had kidney complications in one pregnancy, she will be still more prone to them in a succeeding period of gestation and a chronic nephritis is sure to be intensified during pregnancy. Albuminuric retinitis is a very serious indication, and even when the uterus is immediately evacuated, may become permanent. If nephritis occurs early in pregnancy the uterus should undoubtedly be emptied at once. I am sure some of my colleagues will not agree with me on this point. When there is no retinitis and the period of gestation is nearly over it may be permissible to await a normal termination, but no practitioner should permit himself to be the sole judge. A woman with chronic nephritis should not marry; if she does marry she should not be allowed to become pregnant; if she does become pregnant the pregnancy should be terminated at once.

Puerperal eclampsia would be far more frequently forestalled if all the signals of kidney disturbance, albuminuria, casts and so on, were promptly heeded. Eclampsia may occur without any of these warning signs, but that does not happen very often. It is the duty of every family physician to keep a sharp lookout for renal disturbances among all his patients, and to keep himself informed concerning the newer methods of making a diagnosis of these often obscure and baffling conditions.

602 NORTH WASHINGTON AVENUE.

A Case of Stone in the Ureter Voided After Fulguration

By WILLIAM FRANCIS McKENNA,
Brooklyn.

CASE.—Patient, M. G., admitted to the Brooklyn Hospital Dispensary, genitourinary department, August 25, 1920. His principal complaint was a slight urethral discharge in the morning, occasionally some moderate burning on urination, and at intervals, nycturia. There was no history of sand or gravel. He admitted a Neisser infection about fifteen years previously which was not cured at that time, and also a chancre, probably soft, at the same time. He was a widower, with four healthy children, and except as noted above, in good health. The Wassermann was negative.

Examination at this time failed to reveal any striking abnormality, except a faint haze in both first and second urines. This, together with a report of twenty to thirty pus cells to the field in the prostatic smear led us to make a diagnosis of chronic posterior urethritis, and prostatitis. He was placed upon the usual routine treatment for this condition, but failed to respond as rapidly as we liked, and on September 22, 1920, we sent him in for a cystoscopic examination more as a check than because we believed it would aid in clearing up his condition.

At this examination nothing unusual was noted.

The bladder mucosa was normal throughout. At the trigone there was a moderate capillary injection, and some protrusion of the prostate into the bladder, all of which further substantiated our original diagnosis. Phthalein was excreted from both kidneys in five and a half minutes, and there was no obstruction to the catheter on either side. Sodium bromide, twenty-five per cent., ten mils, was run into the left kidney under gravity, as there had been some pain noted during the cystoscopy on the left side. There were a few pus cells in the left urine, but the urea output on that side was equivalent to the right. Thus far there was nothing to disturb our original diagnosis.

On looking at the pyelogram later one could see an enlarged left kidney, the ureter somewhat dilated,



FIG. 1.—Pyelogram showing stone in calyx of kidney pelvis.

with a stone in the lower calyx. A repetition of the radiogram confirmed our findings, and operation was advised. At that time the patient was unable to enter the hospital, and did not do so until December 2, 1920, about two months after the diagnosis had been made.

Between the cystoscopy, and the time of his admission, there developed a slight amount of pain in the left loin, which he had not previously had, but otherwise there was no change in the symptoms as he first described them. There was tenderness on deep pressure over the left kidney.

OPERATION.

On December 3, 1920, I operated, making the usual lumbar incision, stripping the fatty capsule, and exposing the kidney without difficulty. On palpating the kidney no stone was felt, and I incised the pelvis in the long axis, at its junction with the ureter. The pelvis was probed and no stone found,

and I then passed a long cambric needle through the kidney substance in various planes with no success. The lower portion of the ureter was explored as far as could be reached, and we next fluoroscoped the kidney to be sure we were not missing the stone.



FIG. 2.—Radiogram with opaque catheters showing first location of stone.

I concluded that the stone had passed from the kidney pelvis either into the lower ureter or into the bladder. The kidney pelvis was repaired, the wound sutured in layers, two cigarette drains were left, and the patient was returned to the ward. There was some seepage of serosanguineous fluid and urine



FIG. 3.—Radiogram showing stone after operation.

from the wound for a few days, but the healing was rather rapid, and without infection.

Five days after operation the patient was radiographed again and the stone was seen low down in the ureter, probably at the junction of the ureter and the bladder.

Fifteen days following the operation I again cystoscoped the patient and was on this occasion unable to get a catheter up the left side because of the blocking of the ureter by the stone. I incised the meatus of the ureter and dilated the ureter up to the stone which I could feel against the metal of the dilator. There was no result from this procedure and three days later I again dilated the lower end of the ureter. This was also without effect, and the patient was allowed to go home on condition that he remain under observation. His condition was explained to him in detail.

On March 3, 1921, I cystoscoped him again, and through an operating instrument I fulgurated the lower end of the ureter in its course through the bladder, destroying almost the entire bridge of membrane and some of the muscle forming the arch of the ureter meatus. This was practically painless, and the ureter was decidedly no more patent than with the dilatation. There was no immediate effect from the fulguration, but two weeks later the patient experienced a very sharp colic lasting about an hour, and followed by a little blood in the urine. No further discomfort was noted until May 5, 1921, when the stone was passed with scarcely any pain.

As it appears to me, there are several points of interest in this case. There were none of the symptoms usually noted with stone. Had we not used the x ray in conjunction with the cystoscopy we would have missed the diagnosis completely. It is

our usual routine to radiogram patients with small stones just previous to operation, but this stone appeared so deeply set in the calyx, and there was so little likelihood that it would move, that we omitted this precaution. At its narrowest point the ureter is one tenth of an inch in calibre. This calculus measures two eighths of an inch at its narrowest diameter. It is seven eighths of an inch in length, and three eighths of an inch in width, and weighs seventeen grains. Altogether it is a fairly large specimen to pass, and there is little probability that it would ever have passed spontaneously. The fulguration is probably the cause of the stone's passing

as it did, for it is hard to imagine that the effect of dilatation would occur so late. Incision, if not immediately effective, is not likely to be so later as healing occurs, if anything, lessening the size of the ureter meatus. The fulguration, when reaction has subsided, leaves a more or less permanently relaxed lower ureter, and permits the passing of a stone at any time a colic may occur. Further, as these people are likely to form stone again, a partly patent ureter orifice is valuable for future use. The operative failure is not uncommon in the literature.

One month after the stone was passed an observation cystoscopy showed a ureter orifice practically unimpaired in its function. The radiographs are of particular interest, as they show the stone on the right side, when in reality it was on the left.

125 GATES AVENUE.



FIG. 4.—The stone; weight seventeen grains, length seven eighth inch, breadth two eighth inch, width three eighth inch; material, calcium carbonate.

Chronic Nephritis with the Double Edebohl's Operation*

By NORRIS W. VAUX, M.D.,
Philadelphia.

Several points of interest are brought out in the following report of a case of chronic nephritis in a young boy of six years: The patient, W. T., was admitted to the Chestnut Hill Hospital on January 26, 1921. Previous to admission there was no history of any family or hereditary disease or of any diseases of childhood other than what his mother described as a rather severe cold which occurred about eight weeks previous to our seeing the boy on his admission. The patient was not admitted to my service but I had the pleasure of seeing him frequently with the chief of the medical staff.

All manner of medical treatment for the relief of the condition was fully and painstakingly carried out, with gradual and progressive general edema and the progression of the disease toward what appeared to be an inevitable termination. Diuretics, hot packs, vapor baths, purgation and diet,

all forms of eliminative medical treatment were persisted in for six weeks, and at the end of that period of time the intake was persistently double the elimination. The laboratory test showed, after seven weeks of treatment, that fifteen per cent. was the maximum of the kidney function.

Ascites was so marked and general edema so pronounced that all hope of recovery had vanished under this treatment. Paracentesis of the abdomen was carried out on numerous occasions, as high as eighty-five ounces of clear sterile, amber fluid being removed on one occasion. As there was no advancement or progress in the case, what was considered the last resort, that of splitting the capsule of the kidney, was resorted to.

Under nitrous oxide and oxygen anesthesia the capsule of the right kidney was incised from pole to pole and stripped back toward the hilum. All the tissues were edematous and boggy, the kidney was very large and granular with small subcapsular

*Presented before the Northwest Branch of the Philadelphia County Medical Society.

hemorrhages. However, the wound healed by first intention. Immediately after the first operation the kidney secretions gradually doubled in quantity, the sulphonephenolphthalein test increased from fifteen to thirty-seven and one half per cent., the urine still showed five grams of albumin to the litre against seven before the operation, and a daily decrease in the amount of albumin resulted. The edema lessened markedly, the ascites did not return, and the case progressed most favorably up to three weeks following the operation. Before the second operation was performed the intake and output were approximately equal, the eliminative test of the kidneys was forty per cent. and the albumin had dropped on daily examination from seven and one half to three and seven tenths grams to the litre. The blood picture showed a positive Wassermann from the time of admission, 3,000,000 reds, hemoglobin forty-eight per cent., and a leucocytosis of 12,000. As the boy had improved so much from his first operation and had come to a standstill in his recovery it was thought wise to operate on the other kidney. This was undertaken in the same manner and a similar condition of the left kidney and tissues was found. It was followed by an equally creditable result, so that in fifteen weeks after admission, on May 10th there was only a trace of albumin and a few hyaline casts, the blood had improved to 4,100,000 reds, hemoglobin sixty-two per cent. and a leucocytosis of 9,000, the

kidney function was sixty-two per cent., the intake remained at forty-five ounces, and the kidney secretions sixty-seven to seventy ounces in twenty-four hours. The diet is still carried out, the child is bright and cheerful and plays about the children's ward very strenuously and shows no evidences of having been ill. His treatment is inunctions of mercury every third day, his diet has been somewhat increased and no other forms of medication are considered advisable.

In conclusion I wish to say that the decapsulation operation in chronic nephritis is justifiable when careful and thorough medical treatment has been of no avail. One kidney operated upon at a time under gas and oxygen anesthesia produces no shock or ill effect. The condition of the patient, the intake and output of fluids, diet and blood must be kept in mind, and daily examination of urine with frequent function tests made of the kidney elimination. The operation should be undertaken before the patient is in a moribund condition, and from our results in this case it can be said that no ill effects from the operation were demonstrable. The nitrous oxide-oxygen anesthesia was borne well by the patient, no shock resulting as there was practically no loss of blood. The capsule splitting operation and stripping back freely of the capsule to the hilum of the kidney is a simple and easy operation which in this instance gave a gratifying result.

1807 WALNUT STREET.

Important Points in the Diagnosis and Treatment of Chronic Gonorrhoea in the Male

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New York,

Chief of Genitourinary Department, Stuyvesant Polyclinic.

Much can be written on the subject of chronic gonorrhoea. I will endeavor in my paper to bring to your attention some of the more important points as to diagnosis and treatment. I will ask to be excused if there are any shortcomings in my remarks, as I intend to touch on several points briefly.

A case of gonorrhoea may be called chronic, when it has lasted for ten or twelve weeks. The predisposing causes are numerous, including the following: 1, Sexual intercourse or erotic excitement; 2, use of alcohol or beer; 3, injections which are too strong or used too frequently; and 4, careless ways of living on the part of the patient. There are other cases, although properly treated, which tend to become chronic.

The cause which tends to prolong chronic gonorrhoea is extension of the disease to the posterior urethra, seminal vesicles and epididymis. Any one of these foci may reinfect the mucous membrane of the posterior urethra, which accounts for the relapsing and obstinate cases we so frequently see.

Chronic gonorrhoea may be classified into chronic anterior and chronic posterior urethritis. The favorite points of location are the bulbous urethra; next

in frequency is the fossa navicularis, the widest and most dilatable portions of the canal. Stagnation of secretion often occurs at these points and acts as a focus of infection.

Clinically we may classify chronic gonorrhoea into: a. Superficial or mucous form with subsequent inflammation confined to the mucous membrane usually followed by absorption of exudate. b. Deep form: confined to the subepithelial and periglandular tissues; always followed by stricture.

The diagnosis is made on subjective and objective symptoms as follows:

1. There is an absence of marked subjective symptoms; there may be only a tickling at the meatus.

2. A mucopurulent, thin and scanty discharge from the urethra, often so slight there is only a drop in the morning.

3. Recurring exacerbations are often a common feature.

4. a. If a considerable extent of the urethra is involved and the patient passes urine in two glasses—the first will be turbid and a centrifugal smear will show pus cells, gonococci, desquamated epithelial cells and mucus. b. After the inflammation is

localized the urine becomes clear with a few shreds.

5. The presence of shreds in the urine always indicates that at some point along the urethra the mucous membrane is diseased. (A shred is the secretion which forms a scab and is washed off by the stream of urine)—important whether the shreds are made of puss cells and gonococci or just desquamated epithelial cells from a healed surface.

6. Additional aids to diagnosis are: Bulbous bougies, the endoscope and the cystourethroscope (McCarthy's).

The complement fixation test for gonorrhoea is another valuable aid in the diagnosis and treatment of chronic gonorrhoea. From the summary of opinions of writers up to the present time, the values of the test are: 1. Positive reaction is diagnostic of active foci of gonococci. 2. Negative reaction does not exclude gonococci. 3. When disease is limited to the anterior urethra positive reaction is seldom obtained. 4. A positive reaction in urethral gonorrhoea is not to be expected until after the fourth week of the disease. 5. Positive reaction continues from two to eight weeks after a clinical cure. 6. Positive reaction is obtained in from thirty to eighty per cent. of all cases of chronic gonorrhoea. 7. Positive reaction is obtained in from thirty-three to one hundred per cent. of all cases of chronic prostatitis. 8. In acute arthritis and epididymitis, the reaction is from eighty to one hundred per cent. positive. 9. In iritis the reaction is positive in one hundred per cent. of the cases. 10. Stricture of the urethra gives a positive reaction in sixty-six per cent. of the cases. 11. The reaction is positive in one hundred per cent. of all cases for at least one year after the administration of vaccines. 12. No patient can be considered cured who has a positive reaction. 13. No patient who has a positive reaction should be permitted to marry.

Prostatitis and seminal vesiculitis often complicate chronic gonorrhoea. One should be familiar with the size and feel of the normal and pathological prostate. (Finger and Frank believe that in every case of chronic posterior urethritis the prostate is involved.) The prostate secretion is obtained by making firm pressure of the prostate by rectum. A drop of secretion will flow direct from the meatus on a slide which is held in position for the purpose. Microscopical examination of the stained smear is made. If prostatitis is present the smear will show numerous pus cells and at times gonococci.

For the treatment of the superficial type of chronic gonorrhoea, irrigation gives the best results.

Davis and Harrell at Johns Hopkins, 1918, experimented with acriflavine in dilutions of one to one thousand and one to one thousand five hundred as injections and irrigations and stated that the results were good. They state that the drug is highly toxic to the gonococci; causes minimum of injury to the urethral mucous membrane, and possesses the power of penetrating to the deeper tissues to a high degree. I have used the drug over a period of time and my results and the results of other observers show that the drug is not reliable as an injection or an irrigation. Silver nitrate gives good results in dilutions of from one to three thousand and one to ten thousand. Where the astringent effect is desired in the

absence of microorganisms, irrigation by one to two per cent. zinc sulphate solution is advocated.

In cases which show isolated foci, clear urine and shreds local instillation by the Keys Ulzman syringe twice weekly of from a half to three per cent. solution of silver nitrate changed to copper sulphate solution one to five per cent. or phenol one to five per cent. gives good results.

In deep forms of chronic gonorrhoea with possible stricture formation (to promote absorption of infiltration and restore elasticity of canal) the passage of a F. 22 sound increased up to F. 26 twice weekly is useful. If the meatus is too narrow to admit a sound of sufficient size the meatus should be divided on the floor.

If gonococci are present in shreds or prostatic secretion irrigations of protargol solution are to be employed one to one thousand. The patient is irrigated every day in the beginning, later every other day or every third day. Internal treatment is of little value in these conditions.

For circumscribed areas found by the cystourethroscope or palpation much can be done by applying an astrigent directly to the affected spots.

A chronic posterior urethritis without prostatic or vesicular involvement is comparatively rare. When such cases are met with, however, the best results are obtained by hot irrigations and high dilatation, using a Kollman dilator. The passage of a sound is inadequate. The dilatation must be very gradual and not more than one or two numbers at a sitting and must be stopped immediately if severe pain is caused. It should not as a rule cause bleeding. After an interval of five to seven days when all reaction has died down, dilatation may be carried to a greater degree. After each dilatation the urethra must be irrigated with a dilute antiseptic solution preferably silver nitrate one in three thousand. The pressure and dilatation not only will assist absorption but it squeezes out the contents of the urethral glands and liberates any gonococci which may be lurking there. Should symptoms point to involvement of the prostate the gland should be gently massaged twice a week.

Vesiculitis occurs less frequently than either extension to the prostate or epididymis. It often complicates these cases. Diagnosis of seminal vesiculitis is made by rectal palpation; enlarged or indurated seminal vesicles can readily be detected. Stripping the vesicles once or twice weekly is indicated in inflammation.

To sum up: For a diagnosis, we must determine accurately whether gonococci are in the anterior urethra posterior urethra or both portions of the canal; whether stricture be present, infected follicles, coliculitis, prostatitis or seminal vesiculitis. In a fairly large proportion of cases we may find all of these conditions coexistent.

The duration of the disease is always protracted, and requires patience on the part of both physician and patient. A cure, if permanent, must show: 1, Absence of pus cells in prostatic smears; 2, absence of gonococci in urethral secretions; 3, a healthy prostate and seminal vesicles; 4, freedom from stricture; 5, entire disappearance of shreds.

215 EAST TWELFTH STREET.

Defective Teeth as the Cause of Two Cases of Infection of the Genitourinary Tract and of Two Cases of Asthma*

By G. A. RUECK, M. D.,
New York.

Modern medical men have come to the conclusion that septic conditions of the mouth exert a greater influence on the health of the human being than had been previously thought possible. This conclusion has been supported by bacteriological and röntgenographic examinations. It has caused a revision which is still going on of the entire dental profession, especially since Sir William Hunter made the following statement in 1911: "The worst cases of anemia, gastritis, colitis, of all kinds and degrees of obscure fever of unknown origin, of purpura, of nervous disturbances of all kinds ranging from mental depression up to actual lesions of the cord, of chronic rheumatic affections, of kidney disease, are those which owe their origin to, or are gravely complicated by the oral sepsis produced in patients by these gold traps (meaning crowns and faulty fillings) of sepsis." Septic conditions of the mouth are also the cause of a faulty metabolism which predisposes the "underworked and overfed" to cancer.

The following four cases are extremely interesting for the reason that the diagnosis in three of the cases (the patient cited in Case II consulted me directly) had not been made by my predecessors and that recovery in all resulted when the foci of the dental infection were removed. They should also help to demonstrate the great opportunity for dental surgery in the practice of preventive medicine and may stimulate young medical practitioners to take up dentistry as postgraduate work.

CASE I.—Mr. J. H., of Mt. Vernon, twenty-eight years old, electrician, married, father of two healthy children, saw me first February 3, 1919. Four years ago he had several teeth filled and two crowned. Since that time he had suffered with and had been treated for muscular rheumatism. During the last year he had a burning pain on urination and occipital and temporal headaches, especially in the morning. He felt also a continuous soreness in the middle of the abdomen from the umbilicus downwards. On heavy lifting he had a short, sharp pain in the left side of the abdomen. There was no history of gonorrhoea or chancre. He had had influenza four week before. His chief complaint was a burning pain on urination.

The examination showed him to be five feet six inches in height; weight 165 pounds. The second right and left upper bicuspid had gold crowns and only the right one of these teeth was slightly tender. The ascending and descending colon were flat on percussion. The urinary bladder was slightly tender on pressure. There was pain on pressure over the lower pole of the left kidney; no pain over right kidney and ureters. Urination caused a scalding pain along the urethra. There was no sharp

pain at the end of urination. The urine contained pus.

February 8, 1919. The radiographer found apical abscesses on both crowned bicuspid and a mild alveolar recession of all the teeth. February 19, 1919. The second left and right upper bicuspid were extracted by Dr. A. B. Weil. February 22, 1919. Radiographs of the urinary tract showed no calculi. March 5, 1919. Dr. J. London made a cystoscopic examination and found pyelitis and cystitis. The examination of the urine for bacillus tuberculosis was negative.

TREATMENT.

The following treatment was begun February 4, 1919: 1. Irrigation of colon once a day for one week. 2. Hot foot bath for twenty to thirty minutes every night and a hot flat iron applied to the region of both kidneys for twenty minutes every night for three weeks. 3. Urotropin seven and a half grains three times a day. 4. Lavage of urinary bladder twice a week. 5. Lavage of pelvis of kidneys March 5, 1919. 6. Extraction of diseased teeth February 19, 1919.

On June 14, 1919, the patient showed a gain in weight of thirteen pounds. Patient felt fine and had more ambition for work. The patient went to California and has been in excellent health up to date. Alveolar abscesses developed in the patient soon after the crowning of two of his teeth. These abscesses caused pyelitis, cystitis and urethritis and at the same time pain in the voluntary muscles of his body which was called muscular rheumatism.

CASE II.—Mr. C. C. R., thirty-nine, married, a traveling salesman, born in United States, came to me September 19, 1920, complaining of a urethral discharge of one week's duration without any pain or discomfort on urination. He never had had a gonorrhoeal urethritis and had not exposed himself lately to a gonorrhoeal infection. A microscopic examination of smears made from the urethral and prostatic discharges showed many pus cells but no gonococci. The urine showed a trace of albumin, pus and a few gram positive diplococci. September 22, 1920. An examination of the teeth showed the right upper first molar decayed and two crowned teeth seemed to have apical abscesses. The radiographer, Dr. Philip Lewine, found abscesses at the root of these three teeth.

September 25, 1920.—Dr. Maurice J. Duffy extracted two of the diseased teeth. The patient had to go on a trip. He was advised to drink eight glasses or more of water and Vichy a day and to take seven and a half grains of urotropin every four hours. October 4, 1920. The patient returned from his trip saying that he had had "a cold" and a yellow morning drop from the urethra during his absence. He was advised to take seven and a half grains of urotropin three times a day and a hot foot bath for

*Presented before the Bronx County Medical Society, April 20, 1921.

twenty to thirty minutes every night. October 9, 1920. The third diseased tooth was extracted. This caused great pain and swelling.

October 18, 1920. The patient noticed a slight watery discharge from the urethra and felt well. He went out of town again on a five weeks' trip working hard and wearing shoes laced tightly around the ankle. November 23, 1920. The patient returned to New York with the anterior aspect of his right ankle swollen, red and painful without any visible external lesion. I made a diagnosis of tendosynovitis and had an x ray picture taken in order to ascertain the absence or presence of a possible fracture. The radiographer reported negative as to fracture and inflammation of the bone. The patient was made to bathe his foot in hot water for one hour three times daily and to put a wet compress on it during the intervals. The swelling of the ankle increased and November 27th a two inch incision through the tendon sheath of the tibialis anticus was made by me under local anesthesia. The wound was drained, dressed daily and kept moist with chlorazene solution.

December 13, 1920. The patient became feverish and the wound had to be enlarged under general anesthesia and was in all six inches long exposing the tendon of the tibialis anticus. The patient received at known intervals an autogenous vaccine made from the discharge of the wound and containing dead staphylococci and a few streptococci. After the application of wet dressings for a week the upper four inches of the wound were closed by catgut sutures. The lower part of the wound closed gradually under application of ten per cent. balsam of Peru in castor oil and strapping with zinc oxide adhesive plaster. The patient could return to work February 24, 1921. The tendon was not destroyed by the inflammation and the patient has regained the normal function of his leg. There is now no urethral discharge and the urine is free from pus and bacteria. This patient had three apical abscesses which caused a pyelitis, a urethral discharge of pus without pain on urination and finally a suppurative tendosynovitis.

CASE III.—Mrs. L. M., thirty-three years old, born in United States, mother of two healthy children, had the first severe attack of asthma September 16, 1911, which lasted two weeks. During the following eight years she was slightly asthmatic all the time and had in addition a severe attack of asthma every year occurring from September to December and lasting one or two weeks. When I saw her the first time, ten years ago, she had two decayed teeth and I advised her to have them extracted. She did not follow my advice because I could not convince her of the possibility of a connection between asthma and decayed teeth especially since she thought she could not spare the money for dental work and since a leading surgeon of a hospital staff in the Bronx had told her husband that my statement concerning the cause of her asthma was ridiculous. Gradually more of her teeth decayed and her asthma became worse. She finally followed my advice and in July, 1920, Dr. A. B. Weil extracted all the bicuspids and molars of the lower jaw and also the three left upper molars, all of which had apical

abscesses. The result of the extraction of these decayed teeth was that patient had no severe attack of asthma last fall and that she has been entirely free from even the slightest asthma ever since.

CASE IV.—Mrs. M. P., thirty-seven years old, born in England, mother of one healthy daughter, had been under my care since October 5, 1920, when she had an attack of hay fever. Previous to this she had had bronchitis at twenty-three, frequent sore throats and several times a peritonsillar abscess. She had had hay fever for the last four seasons and had been very ill with asthma in a suburban hospital from August 21st to September 22, 1919. Strange to say, not one of the attending physicians of this hospital ever examined her upper air passages or said anything about the condition of her teeth. She was treated for asthma, that is all, and was promised hypodermic injections of pollen serum. Fortunately she did not get these injections because the physician who had this treatment in mind had to go on his vacation and did not return before the patient left the hospital.

My first examination revealed twelve decayed and defective teeth, small fibrous tonsils with adhesions, one polypus in the upper part of the right nares, a large polypus originating from the middle turbinate and occluding the entire left nares, mucous râles in both lungs and a severe dyspnea. The patient refused any operative measures. My palliative treatment consisted in hygiene of the mouth (brushing of teeth, bathing with Dobell's solution, menthol spray), regulation of the activity of the bowels, Carlsbad salt in the morning, hypodermic injections of morphine and adrenalin when the attacks were very severe, a cough mixture containing potassium iodide, at times smoking of belladonna and stramonium cigarettes and a diet consisting mostly of milk and orange juice.

She suffered severely with asthma last December, January and February when there was no pollen in the air. Finally I managed to get her to Dr. Maurice J. Duffy who, in four sittings, extracted all of the offending teeth. April 20th, the two myxofibromata of both nasal passages were removed by Dr. William M. Dunning. April 27th, I lanced a right and May 2nd a left peritonsillar abscess. Her tonsils will be removed by me as soon as her condition will permit.

The patient has not had one attack of asthma since the extraction of her teeth.

THE CAUSE OF ASTHMA IN THESE TWO CASES.

The pus of the apical abscesses containing many proteins is absorbed. The body finally becomes saturated in proteins and rebels against their continuous intake. We call this condition anaphylaxis. Changes of the blood occur. The red cells have not the power to take up enough oxygen. Air hunger results even before any râles appear. Poor blood weakens all the body cells; even the heart muscle gets weaker. The heart does not pump the blood through the body quickly enough. The lungs become congested and expiratory difficulty results. The secretion of the epithelium of the bronchi is increased causing râles, cough and a feeling of suffocation.

CONCLUSIONS.

There should be a closer cooperation between general practitioner, röntgenologist, dentist, clinical pathologist and the various other specialists for the benefit of the patient. This can be done in private practice as I have shown through my four cases. Physicians who overlook apical abscesses as the cause of disease and dentists who are the originators of many apical abscesses through inefficient work and who try to preserve teeth with apical abscesses at any cost are running a grave risk.

The physician must be the general manager, the trained röntgenologist the final interpreter of the röntgen plates and the dentist the technician in a

case requiring dental surgery. When the physician with the help of the röntgenologist is making a correct diagnosis of defective teeth as the cause of acute infections, chronic diseases, and when he insists upon extraction of teeth with apical abscesses, he is practising preventive medicine.

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750 ST. OVEN STREET.

Some Aspects of Lues in Its Relation to the Psychoses and Psychoneuroses

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Medical Superintendent, Dr. Barnes Sanitarium.

Continuous observation of various patients for a period of several years has only added to the suggestion of noted neuropsychiatrists that lues in itself is an entity and must be treated as such. Whether syphilis is associated with a disease either functional or organic it should not escape the physician's notice. It must be treated as syphilis regardless of complications or added syndrome. No matter whether associated with symptoms of a psychoneurosis or those of a psychosis it must be attacked by vigorous antisiphilitic treatment. Many cases of lues have been recognized only too late for curative treatment.

Patients suffering from syphilitic disease, where the initial symptoms have been none too manifest and with no secondary symptoms, have rested in fancied security with the idea that theirs was a very mild type of the disease and that their apparent good health would see them through. Many such persons have married and had progeny all apparently healthy and strong. They have lived for years with the idea that their cure was absolute. Suddenly in the cloak of a psychosis or a psychoneurosis the lues acquired many years previously again manifests itself and the patients are again subjects for active treatment. If neglected this condition will land them in some neurological clinic or institution for the insane without hope of future cure or very little chance for successful treatment.

In citing a few cases that have come under my observation it is not my purpose to relate all the neurological findings in each individual case nor to give all the seriological or chemical data. I shall relate some of the most marked symptoms present in each case. My point is to emphasize the necessity of early discovery of lues especially in those patients whose symptoms so frequently are those of a neurasthenia or one of the psychoneuroses as well as mildly depressed types of mental disease.

CASE I.—The case of a lawyer, Mr. G., aged forty-five, prominent member of the bar in a large southern city, illustrates the fact that syphilis is many times latent in the individual and not recognized until beyond the reach of our latest methods of intensive treatment. He came to me for treatment during November, 1919. For several months he had shown marked neurasthenic symptoms: was easily tired on slight exertion, complained of vague pains in the head, suffered from loss of ambition and was very irritable. His memory was not up to its former standard. He became forgetful, irritable and easily angered. Finally during the winter of 1918-19 he went to his old home for a few weeks' rest but felt no better. He was then sent to Florida to get the benefit of the warmer climate but he still had all his vague symptoms. During his stay in Florida he had dizzy spells, as he termed them, and could not keep his balance, had a tendency toward falling. During April, 1919, he had a cerebral hemorrhage with subsequent left hemiplegia. Later during November he came to me for treatment and shortly after my first examination a Wassermann blood test was made which showed a four plus positive reaction. Spinal puncture was done and showed a positive Wassermann reaction of spinal fluid. For over a year he had suffered from neurasthenic symptoms but his syphilis was not discovered until he had the cerebral hemorrhage related above.

CASE II.—Another case comes to mind of a Mr. N. whom I first saw April 28, 1919. He was forty-four years of age, a farmer by occupation. His family history was negative. The man had been a tireless worker and had for years worked beyond his strength. He was very ambitious and had built up a large dairy business. For nearly a year he had been very nervous and upset. His work seemed to tell on him and he began to lose physically. He became irritable, lost his temper easily and at times

had severe headaches. During March, 1919, he suddenly noticed a peculiar change in his gait and loss of power in his left hand. After a few days he felt better and was able to do some work. There gradually developed a marked spasticity in his left leg, however, and he had jerky incoordinated movements of the extremities. A little later he showed marked contracture of the left hand, also tendency to claw hand. After careful examination a Wassermann test was made and showed a four plus finding. Spinal puncture showed a positive Wassermann reaction of spinal fluid. After intensive specific treatment for a period of three months the patient was able to walk much better, showed little spasticity of the leg and was able to use his left hand quite well. When questioned as to specific history denied an initial lesion or any knowledge that he had ever acquired lues.

CASE III.—Mr. M., came to me for treatment during 1919. He was suffering from the depressed form of a manic depressive psychosis. The condition had developed after weeks of neurotic symptoms followed by a long period of irritability during which time he left his wife after frequent quarrels. On admission he was typically depressed and showed marked delusions, somatic in character, also those of a religious nature. Said that he was very unworthy and unfit to live: also that he had seen and talked with the Deity on various occasions. Later said that he had a dread disease and he knew he had acquired it as a young man when out sporting and that he was rotten through and through. Had it not been for the fact that he had an eruption eczematous in character all over his scalp I am afraid we would have made no serological tests. A Wassermann was made and it showed four plus positive. After a period of intensive antisyphilitic treatment his eczema cleared up, his mental status brightened and he was taken home by his family who thought him entirely cured.

CASE IV.—Mrs. L. W., brought to me by her husband, Dr. W., for examination and treatment January, 1919. For several months she had shown periods of great irritability, was morose and discontented. At times she had fits of violent anger and was very abusive. She became so upset mentally that she interfered with her husband's practice and caused him much trouble. At last he found it absolutely necessary to remove her to some institution. During examination and while the doctor was relating these facts in her presence it was noticeable that the patient was nervous and excited. She showed marked tremor of the facial muscles and those about her mouth. When interrogated she spoke in short jerky phrases.

On further examination she showed a marked Romberg sign, loss of light reaction in both pupils as well as irregularity of pupils. The knee jerks were absent and she was markedly incoordinated. It was found that neither the Wassermann blood test nor spinal puncture had been made. Such procedure was suggested and the blood Wassermann was found four plus positive also a positive spinal fluid Wassermann. Her husband could not believe it possible when I gave him the serological findings. I had to tell him his wife was a

case of general paralysis of the insane. He was broken hearted over the matter and shortly afterward committed suicide. During my talk with Dr. W. he admitted that his wife had not been the same for the past five years. Previous to that time she was most dignified in her demeanor, lovable, quiet and always friendly with his patients and their relatives, in fact, a woman beloved in her community. That she should suddenly change in her disposition and become the opposite did not arouse his slightest suspicion. Had she been the victim of drink or drugs it would quite naturally follow that she would become irritable, coarse and entirely different in her attitude toward those about her.

CASE V.—A recent case where the patient was sent to me from a local hospital proved to be very interesting and is an example of the necessity of making proper serological tests in all of our suspicious cases. Mr. K., aged thirty-seven, associated with a large business organization, suddenly during January last became very nervous and upset. He laid the trouble to the hard work and strain he had undergone during the recent war. During his stay at the hospital he had been very noisy and upset at night causing much confusion among the other patients and nurses.

On examination the patient presented a wild, frightened appearance and showed a marked fear state. Later he became greatly confused and was unable to answer questions about his condition. The following day he was very haughty and aggressive in his manner. He said that he was entirely rational and needed no treatment. His neurological examination showed patellar reflexes much increased, marked swaying in the Romberg position, tremor of extended tongue and facial muscles, marked tremor of extended hands and pupils reacted sluggishly to light and accommodation. His general appearance, the history of mental upset at the hospital and the marked fear state he has shown, also an exaggerated ego in his conversation led me to have serological tests made. The findings were a four plus blood Wassermann, a three plus spinal fluid Wassermann, a plus globulin increase and a cell count of 52. The patient was put in bed, given absolute rest and sedative treatment. He is rapidly getting into a normal condition and his physician has recommended his return home. He must have intensive antisyphilitic treatment at once as undoubtedly he has an active neurosyphilis.

CASE VI.—Mrs. D. came under treatment during July, 1919. She related that at the age of twenty-four she had developed an infection of her tongue, the result of the prick of a pin. After an illness of three weeks she was apparently all right. She was very well after that until she reached the age of thirty-nine, fifteen years later. At that time she suffered from severe pains in her limbs. Her physician became suspicious and had a Wassermann blood test made with a slightly positive finding. Intensive mercurial treatment was administered and the pains disappeared. The patient remained quite well after that until two years ago during March, 1919, when she became much upset but was kept at home under treatment. On admission she was easily tired and greatly worried. She had lightning pains

in her extremities and was very weak physically. She was hysterical and cried a good deal. The Wassermann test was made and showed a four plus positive finding. She was given modified rest treatment also intensive mercurial treatment. After a few weeks she brightened up materially and was taken home much improved. Recently I met the lady and she reported that she had felt quite herself for some months. Later we found that she suffered from a neurasthenic attack of some months' duration at the age of thirty. Had intensive antisyphilitic treatment been carried on at that time she might have been saved months of suffering. This case only emphasizes the necessity of Wassermann tests over a long period even though we believe the patient cured.

CASE VI.—Mr. F., a patient who presented another interesting case, came to me for treatment during June, 1920. He had suffered for years from mild manic depressive attacks of the depressed form. These attacks were followed by periods of extreme dissipation. During such periods he suffered greatly from alcoholic excess. He gave a history of chancre at the age of eighteen years. Three years ago he had a Wassermann test with positive findings but did not accept treatment. About two months before I saw him he had become very careless about his personal appearance. He had always been careful about his dress, but lately had become careless and slovenly, was very forgetful, would repeat the same questions over and over. He complained of his arms feeling numb and of pain in his legs. At that time he had another Wassermann blood test made with positive findings. The patient was given one dose of salvarsan administered intravenously followed by mercurial inunctions.

On examination his neurological findings showed incoordination; Romberg was present; pupils did not react to light but did accommodate; gait was slightly spastic; knee jerks equal and fairly active, and he showed marked tremor of extended tongue and muscles of the face. In conversation he had a slurring speech and stumbled over test phrases. His emotional state was unstable, at times much elated, again greatly depressed. He seemed to have a fair insight into his condition. He said he would be better off dead as it was impossible for him to get well. He was under treatment six weeks but showed no improvement. In this case had lues been discovered years ago and the proper treatment instituted the patient might have fared better. The alcoholism was probably secondary to a neurosyphilis.

CASE VII.—Another patient, Mr. M., whom I treated during the months of December, 1920, and January, 1921, presented the depressed phase of neurosyphilis. This patient denied positively any previous history of venereal infection. I admit that I had absolutely no idea of lues in his case. For six or seven weeks he showed a marked depressed phase of an apparent manic depressive psychosis. This followed a history of insomnia and worry of nearly six months' duration. At times he seemed a little brighter but for the most part was dull and apathetic interrupted by periods of self reproach and weeping. He showed marked arterial change,

this in itself being suspicious in a man at the age of forty-five years. After he had been under my care for a few weeks his relatives became dissatisfied because he showed no sign of improvement. Finally when their patience was nearly exhausted and they were about to seek other medical advice it came to mind that there was no history of a Wassermann test for lues having been made. I had a Wassermann blood test made with a three plus finding and immediately started antisyphilitic treatment. The patient showed marked improvement in a very short space of time and at the present writing is rapidly getting better.

CONCLUSIONS.

These patients whose history I have related manifestly did not have the benefit of proper treatment in the early stages of their lues. Of course one cannot say to a certainty that they would have been cured had proper treatment been given them years previous to the outbreak of their disease which absolutely unfitted them for their life work and made them invalids for many months.

Our state institutions are populated with hundreds of patients having mental disease with a specific basis. Neurological clinics all over the country are constantly admitting such patients, many of whom were pronounced cured within a couple of years after their initial lesion. In most of these cases no followup had been made or treatment instituted. Many of them married and had apparently healthy children with no thought or suggestion that the dread disease was latent in their system. The first indication that a cure had not been effected in their individual case coming after months of pain and suffering or after prolonged neurasthenic symptoms accompanied by anxiety and morbid depression.

Lues is very insidious in its attack on the brain and central nervous system and our only protection is a continuous followup in the aftertreatment of its victims. No patient with lues should be pronounced cured until several years have elapsed with no positive findings on serological examination at reasonable periods. I was much surprised recently to have a certain specialist inform me that he discharged his luetic patients as cured after two years' treatment, providing that they had showed negative findings in all tests during the second year of treatment.

The early recognition of lues in suspicious cases is constantly before us and it behooves the medical profession to be most careful to have proper tests made at once of all suspected patients and in many of them tests made at a later date should the first findings be negative. We are constantly coming in contact with patients who have suffered from the ravages of lues for many years. The question is, could these patients have been saved years of misery had their disease been discovered in time to give them necessary treatment?

My purpose in writing this paper is to emphasize the tremendous importance of the early discovery and proper treatment of syphilis. If it proves to be helpful in the least to achieve that end it will have served its purpose.

A Contribution to the Mercurial Therapeusis of Syphilis

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In the limited list of antiluetic drugs in our therapeutic armamentarium, arsenic and mercury occupy the foremost place. Ages back they have been used empirically for the treatment of syphilis and now, with all the developments of experimental pharmacology, the progress of our knowledge concerning the *modus operandi* of these drugs is still in its embryonic stage. While test tube and animal experiments have more or less definitely demonstrated that arsenic in its organic form as arsphenamine is a direct spirocheticide, such evidence in favor of mercury, organic or inorganic, is still wanting (1). With all experimental evidence against it, clinically every one admits that mercury has an undisputed place in the treatment of syphilis which the use of arsenic could not so far replace.

The epochal discovery of Ehrlich of synthetic arsenicals has opened new vistas for research along similar lines on synthetic mercurials and within the last decade we had a list of such products worked out here and abroad. Unfortunately, up to the present time we are still waiting to hear something about their application in the treatment of syphilis.

In the meantime certain serum and oily solutions and suspensions of known soluble and insoluble mercury salts have rightly or wrongfully gained some ground. The alleged adaptability of these preparations for intramuscular or intravenous use has naturally found their enthusiasts. After giving them a very thorough trial we came to the general conclusion that the alleged reduction of local injury and general toxicity was only a phenomenal affair. Irrespective of the dose, unless given intravenously, their toxicity was directly proportional to the amount of the immediately ionizable mercury element after administration.

Mercury is a general protein coagulant. This property is more manifest with the soluble inorganic salts. With oily emulsions and serum solutions this property will be manifested, although slowly, due to the slower ionization of mercury in such insoluble suspensions. Consequently the determinations of a therapeutic dose with them is purely empirical for want of knowledge of their rate of resorption. Radiographic examination of the site of injection at regular intervals has demonstrated beyond any doubt a great variability in the rate of resorption of such preparations (2). According to these investigations, the best results were obtained with mercuric salicylate with an average rate of absorption of four to seven days, while some other common preparations in general use required as long as eight to ten weeks. There is, however, a certain degree of advantage in the use of serum solutions intramuscularly as they

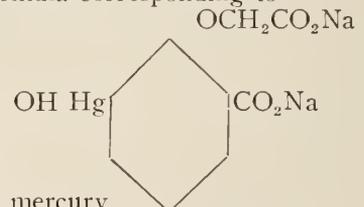
give rise to less local manifestations, but per rate of absorption they are equally toxic.

In modern medicine there are three salient features to be demanded in every therapeutic agent: efficiency, low toxicity, and minimum inconvenience both to the patient and doctor. To be efficient, a drug must control symptoms and be of such nature that the dose must be accurately gauged to control the unpleasant effects of cumulative action. The toxicity must be low in order that a sufficient dose may be given to combat the disease without exercising an unwholesome effect on the general vitality of the patient. The medicament must be of such nature that it may be administered easily and painlessly to the patient and not cause the sufferer to dread and cure more than the disease.

The three necessary qualifications mentioned are not represented in a fair and acceptable degree in the mercurial preparations used up to the present time in the treatment of syphilis.

In 1917 we started some experimental work on a new synthetic organic mercurial (mercurosal) prepared by one of us. Certain attractive features of this new drug, viz., its solubility in water and its relative low toxicity, rendering it adaptable for intravenous administration, persuaded us to give it a thorough trial. Our psychology at that time, after exhausting the list of known mercurial salts and their various combinations, was such that we were eager to give a chance to anything new that even partly did away with certain well known defects of the old list. The experiments were carried out as carefully as the circumstances would allow us. The following is a résumé of our experimental work on this salt.

Mercurosal, the disodium salt of mercury salicylic acid, has a formula corresponding to



with the position of mercury in the benzene ring not definitely established. The percentage of mercury in the commercial product averages between forty-two and forty-three. It occurs as a white powder devoid of any smell and has a slightly sweetish taste which is accompanied by a metallic aftereffect. It is freely soluble in water, giving a perfectly clear, colorless solution with a neutral (faintly alkaline) reaction. If chemically pure its aqueous solution is very stable, otherwise a slight sediment of impurity settles out on

standing which, when shaken, imparts a slight opalescence to the solution.

In an aqueous solution acids, appreciably stronger than carbonic, precipitate out the free acid anhydride of mercury, salicyloxiacetic acid, in which one of the carboxyls is neutralized by the free valence of mercury in the ring. If the aqueous solution is heated or boiled with an excess of strong acids, such as hydrochloric, the mercury is split off from the ring. This property is utilized in analyzing for the mercury content of the sample. Ammonium sulphide added to an aqueous solution of mercurosal does not induce the immediate formation of mercuric sulphide, but within fifteen to thirty minutes (depending on the purity of the salt) a gradual separation of mercuric sulphide sets in. Ordinary neutral salts of alkaline metals do not precipitate mercurosal from solution.

In contact with the soluble proteins, such as blood serum, it first forms an insoluble proteinate which later redissolves on further addition of the serum. In this respect it is similar to other soluble mercury salts, organic or inorganic, with the difference that comparatively less (about one half) of serum is necessary to redissolve the original precipitate.

Its bactericidal value, tested against 0.10 c. c. of a twenty-four hour typhoid culture in 10 c. c. of 1.5 acid broth, in 5 c. c. lots of the drug in dilution, gives a phenol coefficient of four to five (in aqueous solution). Under the same circumstances, and kept at a temperature of twenty degrees centigrade, it kills typhoid bacillus within one to two minutes in a dilution of 1:100, in ten minutes in a dilution of 1:500, and in twenty-four hours in a dilution of 1:50,000. Tested against colon bacillus and *Staphylococcus aureus* it gives practically similar figures.

The minimal lethal dose tested on a series of fifteen rabbits varied between 0.025 to 0.030 grams per kilo weight. If we consider as 0.003 grams the minimal lethal dose of mercury bichloride, mercurosal has one eighth to one tenth the toxicity of the latter. The average maximum tolerated dose for repeated injection (once every three or four days) was 0.003 grams per kilo weight. A safe average intravenous therapeutic dose as determined on luetic patients was one third of the maximum tolerated dose, i. e., between 0.05 to 0.10 grams for an average body weight of sixty to seventy kilos. Such a dose can be repeated every other day until five to ten such injections are administered, when a sufficient length of time should be allowed for elimination. The elimination of the drug is mainly through the kidneys; practically ninety per cent. of it is eliminated within the first twenty-four hours and is complete in three days. Symptoms of mercurialism so common during the course of antiluetic treatment are extremely rare with mercurosal even when it is pushed to the extreme limits. On the other hand, we have witnessed cases under our own care where an already established mercurialism from previous medication has cleared under mercurosal treatment. The reason for this paradoxical phenomenon, in all probability, is due to the peculiar property of mercurosal on kidney cells; while ordinary salts of mercury are more or less toxic to kidney cells, thus giving rise to gradual impermeability and cumulative

toxic manifestations, mercurosal acts as a harmless stimulant enhancing their elimination. This diuretic property is one of the most common symptoms following mercurosal treatment. It evidently has a similar action on the enteric mucosa, giving rise to a mild calomellike action. This property, however, is manifested only after larger doses than usual.

An average dose of 0.10 grams in a solution of 5 c. c. of distilled water given intravenously was found to be a harmless adult dose that can be repeated every third day until ten similar injections are administered in the course of a month. Then a rest of a week or two is given before starting a new course. A slight degree of lassitude and mild headache are a rather common manifestation on the day immediately following the injection; but in the course of a week or two the general tonic effects of mercury become evident with an increase of weight and ambition for work.

One point, however, should not be passed without cautioning the reader in the intravenous use of mercurosal. When mercurosal comes in contact with ethyl alcohol or ether it forms a very toxic product which gives alarming symptoms of shock, something similar to that occasionally met with arsphenamine injections. The salt is always free from the above named ingredients. However, as it is a common practice with some physicians to sterilize their syringes and needles in alcohol or ether, or a mixture of both, it would be of paramount importance to insist on sterilizing their instruments in boiling water so as to avoid this highly unpleasant toxic manifestation. Again, in preparing the arm of the patient care should be taken that the alcohol or ether rubbed over it is completely evaporated before the insertion of the needle. With these precautions in mind, mercurosal will be found to be the safest intravenous mercury salt for the treatment of syphilis.

The question of the therapeutic value of mercurosal in syphilis will be considered together with the clinical analysis of our case records. Before entering into the discussion of our cases, as a preliminary remark, we must make certain facts clear to our readers.

In undertaking to test the healing properties of mercurosal in syphilis, our prime aim was always the welfare of our patients and not mercurosal *per se*. It would be a gross injustice and an unpardonable mistake to deprive our patients of the already established benevolent effects of drugs like arsphenamine simply to try out drugs newly introduced into the experimental field. Nevertheless there were occasions where, for one reason or another, arsphenamine could not or was not given, thus leaving mercurosal as the sole therapeutic agent. We will bring up these points when dealing with the case records.

The general outline of the routine in handling our cases can be summarized in the following: On admission, a careful history of the case is taken and a physical examination is done together with the necessary laboratory data to confirm our diagnosis, such as Wassermann reaction, dark field illumination, and special differential staining, so as to obtain the necessary information concerning the nature of disease, degree of specificity, and the efficiency of further treatment.

The treatment in general consists of monthly courses of one, or at most two arsphenamine injections and either a weekly injection of insoluble mercurials or biweekly injections of mercuriosal. The arsenical treatment is given in column one under the headline of treatment in the case records: OS standing for the original German salvarsan—606; NS for German neosalvarsan—914; SS for German sodium salvarsan—1206; AB for arsenobenzol; DA for diarsenol; AA for arsaminol; NA for neoarsaminol. The decimals following the initials indicate the amount of drug administered in grams. When the kind of arsenical is not known, as in treatment previous to admission, it is given as 606, with the number of injections if known.

Concerning mercurial treatment, prior to the year 1917, we have been using mercuric salicylate 0.06 grams to the intramuscular dose, and mercuric benzoate 0.02 grams to the intramuscular dose. Beginning with the year 1917, we gradually introduced

mercuriosal in a two per cent. aqueous solution, first as intramuscular injections of one to two c. c. and later, seeing that it was not toxic, as intravenous injections of four to eight c. c., our average therapeutic dose being five c. c. Before the end of the same year, the clinical and serological behavior of our cases encouraged us to abandon all other mercurials in favor of mercuriosal. In our case records, Column No. 2, under treatment, M¹ stands for mercuriosal with the number and amounts of a two per cent. solution injected. Hg Benz. stands for the benzoate and Hg. Salic. for the salicylate. Hg Oint. is unguentum hydrargyri.

The course of the disease is given in chronological order divided into monthly courses of treatment or rest. The monthly Wassermanns and the short clinical notes give an idea of the general outcome of the response of disease towards treatment. No patient is discharged as cured unless he insists on discontinuing treatment.

CASE RECORDS
PRIMARY SYPHILIS (STAGE OF CHANCRE)¹

Ser. No. and name	Wassermann dates	Kind of Treatment		Wassermann Test	Clinical notes
		Ars. as "606"	Mercurials Mercuriosal		
1. L. S.	12/18/'16.....			—	Primary 12/18/'16. On admission a freshly developing papule on the dorsum of glans penis two days old. Trep. Pallid. was demonstrated by dark field illumin.
	1/18/'17.....	NS .45	Hg. Salic. 5	—	
			Hg. Salic. 4		
	2/22/'17.....		M ¹ 3-3 c.c.	—	Chancre healed.
			Hg. Salic. 2		
	3/25/'17.....		M ¹ 5-8 c.c.	—	Tongue showed a central mucous patch surrounded by an inflammatory area covering its sides and base.
			M ¹ 5-9 c.c.	—	
	4/2/'17.....		M ¹ 2-4 c.c.	—	Tongue healing, occasional headaches.
	7/15/'17.....			—	
	10/21/'17.....			—	
2. D. H.	6/10/'18.....			—	Subjective and objective signs all in favor of a successful abortive treatment.
	9/23/'19.....			—	
	1/3/'17.....	NS .6	Hg. Salic. 5	—	Primary 12/26/'16. Chancre only one week's duration. Had local applications; unable to demonstrate spirochetes, but he had been to the same woman on the same date with Case III.
	1/30/'17.....	NS .6	Hg. Salic. 1	—	
	2/26/'17.....	NS .45	M ¹ 6-7 c.c.	—	
3. Z. N.	4/1/'17.....		M ¹ 8-13 c.c.	—	Did not develop secondaries.
	6/15/'17.....			—	Learned from Case III., his friend, that he was O. K. Since then lost track of him. Abortive treatment apparently successful.
	9/25/'17.....			—	
	1/3/'17.....	NS. 6	Hg. Salic. 6	+	Primary 12/3/'16. Lesion twenty-seven days' duration. No secondaries, but marked generalized lymphadenitis.
	1/30/'17.....	NS. 6	Hg. Salic. 1	+	
			M ¹ 6-6 c.c.		
	3/4/'17.....	OS. 3	M ¹ 5-7 c.c.	±	
	3/29/'17.....		M ¹ 7-10 c.c.	—	Blisterlike sores on glans penis gradually developing into venereal warts. Warts cauterized.
	4/29/'17.....		M ¹ 5-9 c.c.	—	
	5/30/'17.....		M ¹ 4-8 c.c.	—	General condition excellent, did not show secondary cutaneous manifestations.
4. S. C.	7/17/'17.....		M ¹ 3-6 c.c.	—	
	9/25/'17.....		M ¹ 2-4 c.c.	—	
	11/1/'17.....			—	Date of last treatment, since then lost track of him.
	1/31/'17.....	NS .9	M ¹ 2-2 c.c.	—	Primary 1/29/'17. A small, slightly indurated ulcerating spot over the dorsum of glans penis, two days' old. Had been cauterized and treated locally. Dark field—Neg.
	2/14/'17.....		M ¹ 7-7 c.c.	—	
	3/11/'17.....		M ¹ 5-8 c.c.	—	Ulcer healed in two weeks.
	4/11/'17.....		M ¹ 3-4 c.c.	—	No further development.
5. N. S.	4/25/'17.....		Hg. inject.	+	Date of last treatment; never showed again.
		NS .6	M ¹ 7-14 c.c.	+	Primary (?). Intraurethral chancre developing during the course of gonorrheal urethritis. Was treated by an outside physician with Hg. orally and by injections intramuscularly. On admission, a hard mass blocking urinary meatus almost completely. Marked inguinal lymphadenitis, but no secondaries. Within a week's treatment chancre subsided, patient urinating freely.
	5/22/'17.....	OS .4	M ¹ 5-10 c.c.	+	Patient discontinued treatment.
	6/14/'17.....			+	Returned for treatment in physically good condition. Glands enlarged, no secondaries.
	4/4/'18.....	AB .6		+	The last date we saw him.
	6/7/'18.....			+	

¹ Reports of Cases VI to XII will appear in authors' reprints.

REMARKS.

From a study of our primary cases the following conclusions are drawn:

The abortive treatment of syphilis at the stage of chancre is no more a possibility but a probability. We cannot, however, state with any certainty if mercurosal or any other mercurial can succeed alone without salvarsan. Considering certain cases under our group of secondaries we have grounds to believe that mercurials have no place in the practice of an abortive treatment at the stage of chancre. Table I is a selection of such cases where active mercurial treatment at this stage did not prevent the appearance of secondaries.

The other side of the question, viz., whether salvarsan alone is sufficient for abortive treatment, is outside the scope of the present article. Our personal belief is that it is; nevertheless, with a mixed treatment, we thought we were giving the full benefit of doubt.

REMARKS.

The immediate effect of mercurosal in particular, and probably of all other mercurials, on early cutaneous and mucous syphilides is questionable. Case XVII has afforded us a chance of witnessing the sad outcome of mercurosal treatment alone in early secondaries. After two months' mercurial treatment no apparent benefit has been derived; on the con-

TABLE NO. 1.

Case No.	Date of chancre	Date of admission	Intervening time	Mercurial treatment	Wassermann reaction	Date of secondary eruption			
13.	12/ 5/'16	12/29/'16	24 Days	Hg. Salic. 4	+	+	+	+	1/3/'17
14.	12/20/'16	1/20/'17	31 days	Hg. Salic. 10	+	+	+	+	No history of sec.
16.	5/../'18	8/ 7/'18	3 Months	Hg. Pills.	+	+	+	+	Prior to 8/7/'18.
19.	6/24/'16	7/25/'16	32 Days	Hg. Salic. 50	+	+	+	+	Prior to 7/25/'16.
20.	6/../'16	8/28/'16	2 Months	Hg. Salic. many	+	+	+	+	No history of sec.

SECONDARY SYPHILIS¹
(Early and Late)

13. A. N.	12/29/'16.....	Hg. Salic. 4	+	+	+	+	Primary 12/5/'16. Indurated scar on penis, generalized lymphadenitis.
	1/29/'17.....	OS .6 Hg. Salic. 9	+	+	+	+	No secondaries.
		Hg. Salic. 5					On 1/3/'17 patient's body was covered with a maculopapular eruption, but lasted only one week and faded away.
	3/ 4/'17.....	NS .6 M'l 3-3 c.c.	+				
	4/ 3/'17.....	M'l 4-6 c.c.	—				Intense headache interfering with work and sleep. Patient attributes it to mercurosal so we had to stop it.
	5/ 3/'17.....	NS .6 Hg. Salic. 3	±				Headaches persist with the same severity. Temporary relief with coal tar products.
	6/29/'17.....	AB .4 Hg. Salic. 3	±				
	8/26/'17.....	AB .5 Hg. Salic. 8	—				
	12/28/'17.....		+	+	+	+	Patient discontinued treatment.
	7/ 3/'18.....		+	+	+	+	Returned with late secondary moist ulcers of scrotum and penis. Suppurative inguinal lymphadenitis, discharging. During his absence married to Case 17 and infected her.
14. D. B.	1/20/'17.....	Hg. Salic. 10	+	+	+	+	Primary December, '16. On admission showed the remains of an old preputial chancre. Suppurative cervical adenitis following sore throat, was incised and cured in two weeks.
	4/ 7/'17.....	NS .4 M'l 5-7 c.c.	—				
	8/ 5/'17.....	OS .3 M'l 4-8 c.c.	—				
	12/18/'17.....	AB .2 M'l 4-8 c.c.	+	+	+	+	Mucous patches on penis.
	1/ 1/'18.....	AB .3	+	+	+		Moist squamous syphilids of scrotum.
	2/ 3/'18.....	AB .6	+	+			All lesions healed within a week.
	3/ 3/'18.....	M'l 5-16 c.c.	—				
	6/ 2/'18.....	M'l 2-10 c.c.	—				
	11/12/'19.....	M'l 2-10 c.c.	+	+			Stopped treatment on 8/18/'18 until 11/12/'19.
	2/24/'20.....		+	+	+		Refused further treatment having no symptoms.
	6/22/'20.....	AA .6 M'l 6-30 c.c.	+	+	+		Convinced him that more treatment was needed.
	8/12/'20.....	NA .9 M'l 5-28 c.c.	+	+			
	9/27/'20.....	M'l 5-25 c.c.	+	+			
	11/ 1/'20.....		±				Stopped treatment again.
	9/20/'21.....		—				
16. D. L.	8/ 7/'18.....	Hg. Pills	+	+	+	+	Primary May, '18. On admission three indurated sores on prepuce, external surface. Papular eruption on the extensor surfaces of arms. During treatment developed tonsillar ulcers, healed in ten days. General condition excellent.
	8/21/'18.....	AB .6 M'l 4-23 c.c.	+	+	+		
	9/19/'18.....	AB .6 M'l 8-46 c.c.	+	+			
	10/ 9/'18.....	AB .6 M'l 3-15 c.c.	+				Left for Europe, advised to use Hg. ointment.
	12/ 7/'18.....	M'l 5-25 c.c.	—				Returned for treatment.
	2/26/'19.....	M'l 4-25 c.c.	+	+	+	+	Left again for Europe, returned from Europe, treatment started.
	3/ 4/'19.....		+	+	+	+	Date of last treatment, then lost track of him.
17. M. N.	2/27/'19.....	M'l 6-30 c.c.	+	+	+	+	Primary December, '18. Infected from husband, Case No. 13. On admission, generalized secondary eruption, genital mucous patches. Pregnant 5 months.
	3/30/'19.....	M'l 4-15 c.c.	+	+	+	+	Not benefited at all by Hg. treatment as she is getting worse in all respects.
	4/27/'19.....	NS .6	+	+	+	+	All cutaneous and mucous lesions disappeared in a week following neosalvarsan. Patient never showed up again.

¹ Reports of Cases XVIII to XXIII will appear in authors' reprints.

24. D. F.	3/ 5/'18.....	+ +	Primary unknown. On admission, papulopustular eruption diagnosed as acne vulgaris. A suspicious sore in the nose, probably the site of a primary infection. Patient being a physician was treating luec- tics to which he attributes the source of infection. Eruption disappeared, steadily gaining weight.
	AB .6		
	3/21/'18.....	+ +	
	AB .6		
	M'l 2-8 c.c.		
	4/ 2/'18.....	+ +	
	AB .6		
	M'l 2-10c.c.		
	4/ 9/'18.....	+	Called for military service.
	M'l 2-25 c.c.		Mercurosal was sent to him by mail.
	5/ 9/'18.....	+	Received blood by mail.
	"606"—12 inj. in Army		
	1/21/'19.....	+ + + +	Blood received by mail.
25. L. P.	"606"—15 inj. Hg. Salic. 14		
	8/ 1/'18.....	+ + + +	Primary '17. On admission, mucous erosions of tongue, patches in mouth, sore throat, general lymphadenitis. Last "606" 7/26/'18.
	AB .6		
	M'l 6-35 c.c.		
	8/19/'18.....	+ +	
	AB .6		
	M'l 4-23 c.c.		
	9/ 3/'18.....	+ +	All external signs cleared.
	AB .6		
	M'l 10-52 c.c.		
	10/10/'18.....	+	Patient left for Europe, told to use Hg. Ointment.
	12/ 7/'18.....	—	Returned for treatment.
	M'l 5-25 c.c.		
	12/18/'18.....	—	Left again for Europe in physically excellent condition.

trary, such a treatment did not even help in keeping the condition stationary. One injection of neosalvarsan cleared wonderfully all cutaneous and mucous lesions in a week, what mercury could not do in two months.

On the other hand, as marvelous a drug as salvarsan is in clearing cutaneous and mucous lesions, it often fails in completing a symptomatic; and more so a serological cure when it is used alone without or with insufficient mercury. The persistence of symptoms and serological manifestations in cases where many injections of 606 were given will illustrate our point conclusively.

The place of mercurials as an adjuvant to arseni-

cal treatment in secondary syphilis is of great significance because results obtained by a mixed treatment are more lasting than those by salvarsan alone. The value of mercurosal in contrast to other mercurials in secondary syphilis is incontestable. Practically all of our secondary cases speak in favor of mercurosal treatment in view of the symptomatic and serological result obtained. Relapses have occurred under all kinds of treatment, but when mercurosal in conjunction with salvarsan treatment is persisted long enough there will be very few cases that will not ultimately come under a therapeutic control.

(To be concluded.)

Practical Control of Venereal Disease in England

By ETTIE A. ROUT,
London,

Late Hon. Sec., New Zealand Volunteer Sisters.

I. MEDICAL PREVENTION AND TREATMENT.

The *Annual Report for 1921* of the Chief Medical Officer of the Ministry of Health which has recently been issued marks the beginning of important developments in the personal and practical control of venereal disease in the civil community—the most notable suggestion being for the establishment of a practitioner service. The Report definitely states that prevention is "more important" than cure; that treatment and prevention must not be separated, and that every clinic has direct preventive work to do. "Selfdisinfection apart from skilled advice and supervision" is not recommended, "what is required in all such cases is not general directions for selfmanipulation but prompt and skilled advice . . . in addition to a general recommendation for immediate and thorough cleansing if risk of infection has been incurred, the next appropriate step is to provide facilities for skilled disinfection." The establishment of branch clinics, dispensaries, general medical consulting rooms, etc., is recommended, and (most important of all) the establishment of a practitioner service. "It cannot be too clearly understood," says the chief medical officer, "that the best way of dealing with most cases of these diseases is through the skilful pri-

vate practitioner," and the public clinic, he says, should be looked upon merely as a "temporary organization." No doubt the fact that each separate attendance costs on the average from four to five shillings, and the startling failure of the public clinics in England to effect proved cures, or retain the majority of the patients sufficiently long to make certain they are rendered noninfective, account for the official recommendation of unofficial treatment of venereal disease. On page 115 the following table is published:

	Syphilis	Gonorrhoea	Total
1. No. of persons dealt with during 1919 and 1920	105,619	87,792	193,411
2. No. of persons who ceased to attend			
a. before completing a course of treatment	30,459	28,869	59,328
b. after completion of a course of treatment, but before final tests as to cure.....	9,350	6,481	15,831
3. No. of persons discharged after completion of treatment and observation	8,240	13,300	21,540
4. No. of persons who on the 1st of January, 1921, were under treatment or observation.....	47,894	28,822	76,716

Items (2), (3), and (4), in this table account for only 173,415 of the 193,411 cases of syphilis and gonorrhoea stated to be "dealt with during 1919 and 1920," so that nearly 20,000 venereal patients have to be posted as "missing," in addition to those noted as discontinuing treatment before being discharged.

The chief medical officer hazards the opinion as to patients who do so discontinue that "many of them will probably never have any return of their symptoms," but at the same time he gives the following warning to medical officers: "It is generally necessary in early cases to continue the treatment until long after the first negative Wassermann reaction has been obtained; otherwise the disease may recur and the patient again become infective."

This confirms the evidence given officially by the N. C. C. V. D. before the joint select committee (House of Lords)—Criminal Law Amended Bills—last year. "I do not mean to suggest that everyone who ceases attendance discontinues treatment altogether, but the feeling among the people giving the treatment is that a very large proportion do discontinue and remain in the place in an infective condition."

The chief medical officer says: "It is to be feared that a considerable number of persons requiring treatment, and especially women and girls, do not attend the clinics," and he points out that

"Obviously the clinic must be efficient, but it must also be popular. . . . The general organization must be primarily for the convenience of the patient and not the staff." "In many hospital outpatient departments these conditions," he says, "do not yet obtain."

Again and again the chief medical officer emphasizes this point. "It is futile and a waste of time and money," he says, not to consider firstly the convenience and feelings of the patients, especially the women patients, and he urges proper and adequate arrangements being made for the following:

1. Prompt and satisfactory pathological examination—collection of specimens and facilities for microscopical and other examination—early and rapid diagnosis is important;
2. Hours of opening, including evening hours.
3. The special treatment of women and girls—whose lack of attendance at present is largely due to the wholly unsatisfactory provision made for their convenience and susceptibilities in many clinics;
4. The day by day intermediate treatment of gonorrhoea in both sexes;
5. The supervision of contacts—each infected case being used as a clue to others whose treatment is as necessary as that of the original patient; e. g., the mother of an infected child should be persuaded to bring the other children and their father for advice and thus the family be cleansed of infection;
6. Adequate and continuous treatment—a brief routine course of injections with arsenobenzol compounds in syphilis irrespective of the disease, the obtaining of a single negative Wassermann reaction, or the perfunctory treatment of gonorrhoea are insufficient and do not constitute adequate treatment;
7. The effective "following up" of all cases (not necessarily by letter).

No portions of this extraordinarily valuable report should be read with greater care than those referring to the need for skilled training and great study among medical practitioners themselves. "There is still much need for improvement in staff," we are told. "The medical officer must be appointed (to the venereal clinic) not because he happens to be on a hospital staff but solely because he is thoroughly competent and skilled. The success or failure of the work depends mainly upon him. He must be prepared to devote himself to his task and adopt hours and arrangements convenient to the

patient. The whole medical nursing and orderly staff should be competent, should serve under one head officer, and should work together in a prearranged and agreed system of coordination. Women doctors or nurses should be present in all clinics for women and girls. . . . The time has come . . . for intensive culture, for much more thoroughness, for a fuller and more exact understanding of the absolute necessity for attention to detail if lasting success is to be obtained. I am bound to advise that if the work of these clinics is not properly done—if it is casual, superficial or perfunctory—they should be disapproved by the Ministry. It is better to have only a few clinics well organized and scientifically controlled than a large number which are not thus administered."

Finally, the Chief Medical Officer calls special attention to these three points:

First, the authorities should now make arrangements for the effective treatment of women and children infected with syphilis and gonorrhoea who are in attendance at maternity and child welfare centers.

Second, the county authorities should have as part of their schemes suitable arrangements for dealing with venereal disease in small towns and rural districts.

Thirdly, it is extremely desirable that fuller arrangements should be made by authorities for bringing the general medical practitioner within their schemes of treatment or education.

And to facilitate what is termed "the best way of dealing with most cases of these diseases," viz., through the skilful private practitioner, the chief medical officer definitely suggests the setting up of a "practitioner service."

Taking all these matters into careful consideration—particularly the last named—and knowing that the cure of infected women is greatly retarded by infrequent medical treatment, by undoubted inability to apply home treatment, by continual reinfection (especially in the case of married women), by the contraction of mixed infection during the course of treatment, and above all by failure to give skilled advice in personal hygienic measures for diminishing the risks of infection and failure to provide and recommend the most suitable substances for this purpose. I am now endeavoring to assist in the organization of a private practitioners' (venereal) service association on the following lines:

1. That a private practitioners' (venereal disease) service association should be formed, consisting of qualified medical practitioners as members, and the lay public as associates, for the purpose of promoting and providing the following:
 - a. Skilled treatment for venereal diseases by private practitioners;
 - b. Ablution for women;
 - c. Instruction in personal disinfection;
 - d. Sale of suitable disinfectants and literature.

The policy of the association to be controlled by an advisory council.

2. That dispensaries for women (and later for men) should be established as voluntary institutions;
3. At these dispensaries there should be a general medical consulting room in charge of a qualified venereologist, where advice can be obtained and medical examinations made (pathological investigation and diagnosis work to be done at approved laboratories);
4. Continued treatment by practitioners would not be given at these dispensaries either by the venereologist in charge or by the honorary advisory staff of private practitioners connected with the dispensary;

5. Infected women requiring continued medical treatment, and able to pay for this, should be treated privately at the practitioners' own rooms; and those patients unable to pay should be referred to the public clinics;

6. Facilities for ablution in suitable toilet cabinets, under the supervision of a trained nurse, should be available twenty-four hours a day;

7. Medical officers attending public clinics should be requested to advise infected women unable to give themselves home treatment to make use of the dispensary ablution facilities;

8. All women patients and any other women who sought advice should be given oral and written instructions in immediate self disinfection and sexual sanitation generally, individually and personally, under the supervision of the venereologist in charge of the dispensary, so that the present serious leakage in health and wealth due to continual infection and reinfection of women should be lessened as far as possible; and if possible, ordinary toilet facilities and reading rooms, etc., should be available to all women at the dispensary (whether patients or not), and every pains taken to render the establishment popular and acceptable to women generally;

9. A sales dispensary should be run for the sale of cheap portable disinfectants in suitable form for personal application, for the sale of all sexual toilet articles, suitable literature, and printed directions for men and for women in immediate self disinfection, definite and personal instruction to be given in sexual sanitation when sales are being effected if required by the purchasers;

10. Printed lists of private practitioners qualified and willing to treat infected women at dispensary rates (to be agreed upon) should be issued free at the dispensary; also printed lists of chemists willing to sell suitable disinfectants and apparatus at fixed prices;

11. If possible, a suitable private house or other premises be obtained as a free gift or loan to the private practitioners' (venereal disease) service association; if such gift or loan is not available, then a group of private practitioners should be asked to establish a dispensary among themselves, where they would give voluntary advice to patients, but treat any paying patients at their own rooms;

12. Members of the association should pay an annual subscription of two guineas and associates an annual subscription of one guinea, and patrons should be sought willing to donate sums of money for the establishment and maintenance of the association and its work.

Of course privacy is greatly desired by all men, and particularly by all women, seeking treatment for venereal disease, and there is no doubt that the chief medical officer's suggestion of distributing the patients among the private practitioners rather than encouraging them to come to public clinics will help to secure this. But patients need to know which practitioners to go to, and at present there is no proper means of their ascertaining this. The chief medical officer tells us that: "Special provision is now made in all the twenty-two medical schools of England and Wales for teaching medical students the diagnosis, pathology, and treatment of venereal disease; all the venereal disease clinics approved by the Ministry of Health are open for the instruction and assistance of medical practitioners; and the medical schools provide opportunities for the special postgraduate study of these diseases and instruction in the application of new methods of treatment."

Thus there would be no difficulty in making up suitable lists of really qualified venereologists. Arrangements could certainly be made with such practitioners to treat cases at suitable rates of payment, the fees being found by the patients themselves wherever possible. The estimated sum required for the treatment of venereal disease out of the English taxpayers' pockets for the coming year is no less than £560,000, and this of course does not cover nearly

all the public expenditure made directly and indirectly in this connection.

Whatever we may think of the past efforts of the Ministry of Health in regard to the control of venereal disease, we should certainly respond to the chief medical officer's call to review the whole situation. Indeed his report is more than confirmed by the latest information available from the United States of America—particularly from Pennsylvania. There some thirty public clinics have been established under the commissioner of health (Dr. Edward Martin), the commissioner's department being divided into three branches—medical, social, and legislative, the medical branch having entire supervision and financial responsibility for the clinics. Free treatment is given in these clinics only to those patients whose economic conditions will not permit treatment either by private physicians or by clinics charging a nominal fee. Upon entrance, patients are questioned as to their ability to pay for services. Those able to pay a private physician are referred to outside doctors who are registered with the clinics. If in a position to pay only a small sum, they are referred to hospital clinics which charge a nominal fee. Indigent patients are treated free in the state clinics. Continuance of treatment of a patient is ensured by sending a notice to return for treatment. If this does not effect a return, a clinic makes use of the legal machinery at the disposal of the department of health. Through an act of the state legislature passed in 1921 there has been placed at the disposal of the department of health a modern four hundred bed hospital for the care and treatment of syphilitic patients who are menaces to the public health. Immediate treatment (venereal prophylaxis) for those exposed to disease has been approved by the Pennsylvania State Department of Health. Prophylaxis as used in the Army by means of stations is considered impractical in civilian life. Tubes containing material for immediate self-disinfection are given the department's approval, when after tests they meet requirements. The material usually employed is after the formula of Metchnikoff, and the tubes of calomel ointment are on sale in drug stores with printed directions, by authority of the Commissioner of Health.

In England the claim that disinfectants with suitable directions should be on sale to, and brought to the knowledge of, the general public has been fought inch by inch on the ground that unless vice is kept dangerous the morality of the English nation is in grave danger! The promotion of cleanliness is believed to be equivalent to the encouragement of vice. Thus there are, so far as my enquiries go, hardly any shops in London where women's bidet pans can be purchased. Several French chemists told me these used to come from Austria before the war, and now they are practically unprocurable. So it is little use recommending women liable to infection to use this method of cleansing themselves. Under date of August 16, 1921, I have a note from the Ministry of Health saying: "In reply to your memorandum of the 11th instant, no ablution centres for women of the kind referred to (for venereal prophylaxis) therein have been provided by local authorities under their approved scheme."

The promotion of sexual cleanliness by personal disinfection is not approved officially: only skilled disinfection in depots is recommended—but there are no depots, and not likely to be any apparently, in most parts of England. Manchester is the exception. Two depots have been established there—for men only—and the average cost of each single ablution is just over half-a-crown. It is quite obvious therefore that if sexual sanitation is to be promoted at all, it must be on the lines of individual responsibility and expense. The ratepayers will never consent to tax themselves to the extent of 2/6 per "risk." Even in regard to disease, the general opinion of thoughtful medical officers in this country, as in America, is that the provision of secret, quick, certain, and much advertised free for all treatment at the public expense of diseases usually contracted by sexual promiscuity is a scandal in ethics, and necessarily leads not to the control but to the spread of both disease and immorality. The so-called sinners find it much easier to rely on luck than bother about personal cleanliness; and if they are "unlucky"—there is the free clinic to go to. Medical practitioners also hold that the present weekly or bi-weekly treatment (instead of daily treatment) is unscientific and ineffective—therefore involving great waste of public money—and that the clinics are greatly abused by persons who can perfectly well afford, not only to buy their own disinfectants to minimize the risks they insist on running in spite of all exhortation to the contrary, but also to pay for private treatment of diseases they have wilfully risked contracting. If there were some form of compulsory confidential notification of venereal disease in England to ensure continuous treatment until the patient is cured or at any rate rendered non-infective, then the public expenditure might be justified to some extent, but where the ministry of health has no control over the patients whatsoever, and the patients simply come and go as they please, or do not come at all, obviously no good purpose is served by encouraging infected persons to go to the free public clinics at the expense of the ratepayers rather than to go to private practitioners at their own expense, or to clinics charging small fees as in America.

Apart from private treatment for disease, the encouragement of sexual sanitation by individual cleanliness and selfdisinfection where necessary is the only way in which in England any impression can be made on the venereal problem. That is the policy of the Society for the Prevention of Venereal Disease: to teach individual disinfection: but that policy is inoperative at present because the Ministry of Health will not inform chemists what materials are best suited for sexual disinfection, they will not authorize suitable printed directions (have indeed forbidden the distribution of these), and they will not furnish any society with funds for teaching the public how to keep themselves clean. The Venereal Disease Act 1917 definitely states that "a person shall not hold out or recommend to the public by any notice or advertisement, or by any written or printed papers, or handbills, etc. . . . medicaments for the prevention . . . of any venereal disease:" but it is provided that "nothing in this

section shall apply to any advertisement, notification, announcement, recommendation, or holding out made or published by any local or public authority," etc. But the onus of failing to prevent venereal disease does not rest entirely on the shoulders of the Ministry of Health: it rests equally on every local public health authority which has failed to authorize suitable substances and directions for the prevention of venereal infection. When giving evidence before the National Birthrate Commission the representatives of the Ministry of Health put the matter quite plainly, as a reference to the evidence of Mr. A. B. Maclachlan will show (pages 216-217-218): "There is no reason why a municipality should not do as it likes. The approval of the Ministry of Health is only necessary when it is asked to pay part of the expense . . . I think it desirable to make it quite clear that the Ministry of Health is not a department which does these things itself. It is not comparable to the War Office."

The public in this country, as in every country, needs to be taught plainly that syphilis and gonorrhoea are not immoral diseases: that they are simply dirt diseases contaminating innocent and guilty alike—may indeed hit the innocent and miss the guilty. They cannot be given this and other information in regard to sexual sanitation except in properly authorized clinics and dispensaries, and women will certainly go to such dispensaries as soon as they are conducted with intelligence and kindness—that is, made acceptable to the women themselves. The first thing to realize, so far as women are concerned, is that the prevention of fecundity and the prevention of infection are parallel problems, and must go hand in hand. The second thing is that society is not now making suitable provision for the satisfaction of the normal sexual needs of men and women by marriage—therefore a large amount of extramarital relationship is inevitable; and thirdly, the majority of adult persons all over the Empire are now determined to have sexual intercourse, if possible, without fear of infection and without fear of impregnation, but to have sexual intercourse at their own option in any case. Their view is that their bodies are their own, and they will do what they like with them. Those who deny this natural right and suppress a knowledge of selfdisinfection are merely forcing men and women to rely on luck instead of prophylaxis. Whether such freedom of conduct can safely be granted or taken, in the absence of any medical supervision or control of public women remains to be seen. My own experience in Egypt, France and England convinces me that so long as infected women are left free to spread disease as they like, they will succeed in contaminating men faster than the medical authorities can provide disinfection, and very much faster than the moral authorities can ensure continence. Thus the social evil tends to go from bad to worse, in spite of all one can do by means of prophylaxis. Nevertheless it is by prophylaxis, and by prophylaxis alone, that there is any practical hope in England of checking the spread of venereal diseases. (Article II will deal with tolerated houses, supervision of contacts, compulsory notification, welfare centres, different methods of prophylaxis.)

Editorial Articles

VENEREAL DISEASE IN GREAT BRITAIN.

In a circular just issued to county and county borough councils in England and Wales on the subject of the prevention and treatment of venereal diseases the Ministry of Health makes the important announcement that the Government has decided that it cannot give official support to selfdisinfection as a policy. It is recalled that the general conclusion of the interdepartmental committee, which considered the question in the light of the experience gained during the war, was that although certain drugs, properly and skilfully applied, may be efficacious in preventing venereal disease, the most carefully organized system for the supply of these drugs in packets and the instruction of soldiers as to their use did not produce such a general reduction in the incidence of disease as to warrant their recommendation for general use by the civilian population. Moreover, it was found that where preventive treatment by a skilled attendant was provided, after exposure to the risk of infection, the results were better than when the same measures were taken by the individual concerned, even though he had received the most careful instruction. The Government has given careful considerations to the views of the official interdepartmental committee and the unofficial subcommittee of the National Birth Rate Commission published recently and find that there is general agreement that the best way to avoid risk of disease is to abstain from promiscuous intercourse, and that disinfection immediately after exposure to risk of infection is effective only to the extent to which it can be thoroughly applied in the particular case.

The actual situation which confronts the Government is that there is not unanimity of opinion on the medical side as to the practicability and likelihood of success of selfdisinfection for the civil population, whereas on the moral and social side most weighty objections are advanced against it. It is clear that this question is one which cannot be decided solely by reference to medical opinion; moral and social considerations of very great importance are involved in it. In the circumstances the British Government has decided that it cannot give official support to selfdisinfection as a policy. It is added that this decision emphasizes the importance in the interests not only of the individuals concerned, but also of the community in general, of continuing and extending public instruction and enlightenment concerning the dangers of these diseases, and

it is urged that no opportunity should be lost of influencing public opinion on the matter. The Minister suggests the advisability of widespread distribution of leaflets and other methods of instruction by local authorities, warning the public of dangers of venereal diseases and containing advice on the following lines: 1. The prevalence of venereal diseases is a grave source of danger and ill health to the public. 2. These diseases are usually contracted through promiscuous intercourse, and the best way to avoid risk is to avoid such intercourse. It is the duty of all individuals who have incurred, or think they have incurred, the risk of contracting disease, to cleanse themselves thoroughly and immediately and thereby diminish the risk. 3. If any signs or symptoms of disease, however slight, are experienced, the individual should promptly seek medical advice, or attend a venereal diseases clinic. 4. Any attempt at selftreatment is likely to be disastrous.

The Minister of Health has expressed the opinion that the arguments which have influenced the Government in deciding against any official policy of selfdisinfection do not apply to the provision of ablution centres where facilities are provided, with proper safeguards for disinfection by skilled attendants acting under medical supervision. The experience so far obtained is not sufficient to enable any final conclusions to be drawn as to whether such centres should be established in large towns; but the evidence available as to the results obtained in different armies justifies further experiments of the same kind for the civilian population, and the minister is accordingly prepared to consider applications for the approval of the experimental provision of further ablution centres. With regard to questions which have arisen as to the precise effect of section two of the act of 1917, the minister is advised that a druggist does not commit an offence by selling any substances for which he is asked merely because they are capable of being used as disinfectants against venereal diseases, so long as the substances are not sold accompanied by any written or printed recommendations or instructions as to use.

The circular referred to and quoted from above shows that the National Council for Combating Venereal Diseases and the Society for the Prevention of Venereal Diseases are almost as far from agreement as ever. The Ministry of Health is at one with the National Council for Combating Venereal Diseases in opposing the proposals of the Society for the Prevention of Venereal Diseases that

every facility should be afforded for immediate self-disinfection. However, the society is still strenuously endeavoring to carry its points, and the matter seems to be by no means settled by the recent decision of the Ministry of Health.

INTRAVESICAL CYSTIC DILATATION OF THE POSTERIOR URETHRA.

Although congenital in nature, intravesical cystic dilatation of the urethra may not be manifest clinically until between the ages of forty to seventy years. Nevertheless, from the etiological and clinical viewpoint the congenital character of the process is made evident by the frequency of its appearance in very young children, even during the early months of infancy. The frequency of this process in the female is less easily explained. According to Okomoto, it is the result of laxity of connective tissue, but it might be better if we frankly admitted our complete ignorance. During the early phase of its evolution the affection progresses silently in some cases, while in others the patients suffer from birth with an imperious desire to micturate frequently, a condition frequently leading to incontinence. These are the most usual symptoms at the onset as well as pain without discharge on micturition. They are merely symptoms of vesical irritation due to the presence of a cyst in the bladder acting as a foreign body, causing contraction of the bladder and engendering frequent desire to empty the bladder, while at the same time it hinders contraction and makes the process painful. The cyst may also reduce the bladder capacity in direct ratio to its size.

A large share of these symptoms, however, must be attributed to cystitis and urethral infection, as is shown in many cases by the occurrence of pyuria and terminal hematuria. Another symptom is retention, usually intermittent and temporary, but may occasionally be total and require the passage of a catheter. The phenomena of retention are undoubtedly due to the fact that at the time of contraction the lower pole of the cyst comes up against the internal orifice of the urethra forming a plug. If the cyst is pedunculated and movable the retention will suddenly cease as in calculus, especially when the patient lies down. When a large cyst becomes engaged in the urethra it must necessarily obstruct the canal, but strange to say this has not been noted in the cases reported. Prolapse of the urethra is also noted in cystic dilatation and although no reason can be given it occurs more frequently in young children than in adults. It may be intermittent and can usually be reduced easily. The tumor is slack when in repose and gives the sensa-

tion of a partially filled cyst becoming tense when the child cries. An erroneous diagnosis of prolapse of the vesical mucosa is usually made in these cases, because the mucosa may be more or less necrosed, presenting dark red or black patches. Beside this pseudoprolapsus and the bladder symptoms there are other symptoms leading one to suspect a renal lesion. Severe pain in the lumbar region with paroxysms resembling renal colic, uniformly cloudy urine with abundant deposits, enlarged painful kidneys, pain being brought on by palpation along the tract of the ureters, all are symptoms indicating an inflammatory involvement of the upper urinary tract.

Briefly, the majority of the symptoms of intravesical cystic dilatation of the urethra are symptoms arising from its complications, while those properly belonging to it have little diagnostic significance. Generally speaking, a physical examination gives no data as to the lesion itself and in only one case (reported by Pasteau) did combined palpation reveal a calculus located in the posterior end of the urethra, and the surgeon thus led to suspect a coexisting intravesical cystic dilatation of the canal. Diagnosis of the process can be made only with the cystoscope. Without this the true nature of the disease will remain unknown for years to the great detriment of the patient, for although the prognosis is good in general, serious accidents may arise and even result in death. One patient died from intraabdominal rupture of a pyonephrosis, the result of the urethral process.

If a diagnosis is not made and the urethral lesion remains untreated infection of the upper urinary tract is bound to occur sooner or later. The treatment is surgical and several operative procedures have been employed according to the case. Suprapubic cystotomy followed by complete excision of the cyst has been successful, while endovesical treatment by division or, better still, free cauterization of the cystic pocket, will result in recovery.

THE LIMIT OF THE DURATION OF PREGNANCY

The question of the possible limit of the duration of pregnancy arose recently in a suit for divorce brought by a British soldier, whose wife gave birth to a child three hundred and thirty-one days after his return to military duty. The medical experts were not asked to testify that pregnancy could last three hundred and thirty-one days, but merely to state any scientific reason which would make such a duration physically impossible. They agreed that there was no such scientific reason, and since no evidence of adultery was presented the Lord Chan-

cellor accepted the testimony of the mother and denied the application for divorce which had been made by the husband on the ground of adultery.

The common law of Prussia recognizes three hundred and two days of pregnancy as possible, while the Rhenish and French civil codes place the limit at three hundred days. Under the limit admitted as possible in this British case, three hundred and thirty-one days, a child might inherit property as a legal heir in the United Kingdom who would be deemed illegitimate in Prussia, where three hundred and two days is the limit under common law, and might be legitimate in Prussia though illegitimate in France or the Rhine provinces, where under the code three hundred days is the limit of pregnancy recognized by law.

In the reign of Edward II the Countess of Gloucester gave birth to a child one year and seven months after the death of her husband and the child was adjudged legitimate. The presumption is always in favor of the legitimacy of the child born in wedlock and this presumption can only be overborne by strong evidence to the contrary. Indeed, any child born in wedlock was held to be legitimate under early English law, so long as the husband was not "beyond the four seas" and was not impotent, but this ruling has not held for several centuries.

The presumption is that birth will take place on or about the tenth menstrual period after that upon which conception has ensued. Since the ordinary menstrual period is twenty-eight days this would make the normal term of pregnancy two hundred and eighty days. But since there is a variation in this term in different women, the woman who has a shorter interval between menstrual periods would probably have a shorter period of gestation than two hundred and eighty days, while the woman who has a longer interval may have a correspondingly longer period of gestation (Wharton and Stille, *Medical Jurisprudence*).

In an analysis of fifty-six cases reported by various authors (*loc. cit.*) the average duration of pregnancy, dating from a single intercourse, was two hundred and seventy-six days, the shortest term two hundred and sixty days, and the longest two hundred and ninety-six. Calculations based solely on suppression of the menses are of course not to be depended on since this may be brought about by so many other causes than pregnancy.

In a Pennsylvania case reported in the *American Journal of the Medical Sciences* it was held that the law fixed no ultimate term of possible delay in gestation, and Professor Atlee, in that journal, mentioned a case in his own practice where the period was about a year. The latter period has received

the sanction of the law in Pennsylvania as the longest period of indulgence which the law allows to a married woman who has a child in the absence of her husband. This goes much further than the term in the English case of three hundred and thirty-one days.

According to Stewart (*Legal Medicine*, p. 177) many cases apparently well authenticated have been found in which the period extended to eleven lunar months (three hundred and eight days) and longer, but it is difficult in these cases to fix upon a definite starting point from which to reckon the period of gestation.

In considering the possibilities of delayed pregnancy the length of time during which the spermatozoa may keep alive in the hostess before actually uniting with the ovum must be taken into consideration. Recent German investigations indicate that this may be as much as fourteen days. Indeed, it would be difficult to place a definite limit beyond which the spermatozoa could not live. Theoretically, of course, it could not survive over the menstrual period.

PHYSICIAN AUTHORS: SIR FREDERICK TREVES.

Another book, *The Riviera of the Corniche Road*, by Sir Frederick Treves, the most famous surgeon of the United Kingdom, is off the press. Like almost all his other nonmedical writings, this book is an engaging volume of description, observation, and genial philosophy, spiced with a dry but delectable humor. Sir Frederick is a great traveler and enjoys writing about his travels. The world has long known him in other than medical fields, although it was as a surgeon and an author of surgical books that he rose to fame. There was a time when he was said to be the most prolific surgical author alive. His pen and his knife were, in his earlier days, never idle, and his medical books were classics on both sides of the Atlantic. His best known work was his *Manual of Operative Surgery*, a book of especial value to beginners in the profession. Beside the manual he is, in the medical field, the author of innumerable brief articles on various phases of medicine and surgery, several treatises on intestinal obstruction, peritonitis, appendicitis and other diseases, a German-English dictionary of medical terms, volumes on physical education and other subjects, and a treatise on the medical side of the alcohol problem.

It was in 1900 that he branched out as a nonmedical writer. In that year his *Tales of a Field Hospital* appeared. This was a short volume written after his return to London from the Boer War, in

which he served as consulting surgeon to the field forces in Natal. He was with the main column from Colenso to Ladysmith. The *Review of Reviews* said of this book that "for delicate humor and pathos, descriptive power and for tender sympathy with the wounded soldier, this little book has no equal in the literature which the war called forth." His other books include *The Other Side of the Lantern*, an account of a tour of the world; *Highways and Byways in Dorset* (his native shire); *The Cradle of the Deep*, an account of a West Indian cruise; *Uganda for a Holiday*, which is descriptive of Uganda, its people and its plant and animal life; *The Land That Is Desolate*, dealing with Palestine; and *The Country of the Ring and the Book*, dealing with the land which is the background of Browning's poem.

The war left Sir Frederick no time for writing books. Although he had retired as an active practitioner, the war called him into service again as president of the Headquarters Medical Board of the British War Office, as a member of the advisory board of the Army Medical Service, and as a member of the Army Service Commission. Now that the war is over, he is again in retirement, and it is probable that in the course of time there will be other delightful volumes from his pen. His only official position now is that of Sergeant Surgeon to the King, which he has been since he performed, on June 24, 1902, the operation which saved the life of King Edward VII, father of the present King. Sir Frederick retired from practice before he was fifty-five, and when his fame was at its zenith, saying that "It is better to retire decently when you can do so than live to be kicked out later for incompetence."

During his years of practice he was an indefatigable worker, rising at five every morning and retiring promptly at ten, but regularly each year he took a three months' vacation, generally on the sea. His chief interest outside the medical profession was, in his active days, the sea, its men and their history. He was an expert swimmer and could manage almost any kind of water craft. He was, and is, an enthusiast for boat sailing and sea fishing and he held a pilot's certificate. Yachting was his own remedy for jaded nerves. The rock bottom axiom of his life, it is said, was "Early to bed and early to rise, and long and absolute holidays," a motto which is popular with so many other great men.

Treves was born in Dorchester in 1853 and received his general education at the Merchant Tailor's School, after which, having decided to become a physician, he pursued his medical studies in London Hospital. When he was twenty-eight years old he was appointed Hunterian professor of anatomy and

Wilson professor of pathology at the Royal College of Surgeons, posts which he held for six years with marked success. His fame became international and graduates and undergraduates from all parts of the world went to London to hear him lecture and explain cases. His specialty, to a great extent, was operations affecting the intestines. In England, at least, he was the first to introduce the removal of the appendix. "His name," says Wilfred T. Grenfell (in *Putnam's and the Reader*, February, 1909), "was always a guarantee that there was something he wanted to say that was worth saying, and however dry and professional that was, his article or lecture always was full of dry, terse humor. . . . You would wonder how the solemn scientific authorities that you yourself have stood in awe of could have listened to such sensible, but revolutionary speaking, unless they preferred to think it was all banter. He couldn't do the most ordinary thing in a conventional way.

"His *Manual of Operative Surgery* is just like the man," continues Grenfell. "It says, 'do this one thing,' 'use that one instrument,' 'make that particular incision,' 'insert that ligament and no other'—so that you can go up to your work confident that all will go well. You are no longer in doubt, and the trepidation resulting from it, even though there may be better ways of working, for you are inspired by your author's own confidence—a feeling so absolutely essential to success in surgery. You seem almost to see your patient walking away well and grateful before you begin."

Incidentally, Sir Frederick Treves was one of the founders of the British Red Cross Society and was the first chairman of its executive committee.

REAPING ITS HARVEST.

Ellsworth Huntington, in his fascinating speculations on the connection between health and—well—everything else in the world, from the fluctuation of the stock market and the ebb and flow of the tide of immigration to the rise and decline of the Roman Empire, places health, or lack of it, as the primary cause. At present it seems as if the reverse way of looking at the matter is the truer one. While much public health work of a general nature is going forward, local efforts in this direction are suffering a slump with the decline in business prosperity. Economy has begun not only at home but in that office which is most nearly at home, which is most concerned with the welfare of the home—the department of health.

While this is but another example of popular ignorance and indifference to the aims and achieve-

ments of health activities, it argues not a little for the suspicion that health departments have not done all they might to prove themselves worthy of the support they have received. Too often the personnel is one with little or no special training. They just grew up in health work. They are political appointees and servants, and devoid of the sense of their responsibility. The work of the department has been done with little inspiration and with a minimum of effort. The health officer is a health officer only. The greater portion of the active health work has often been done by private agencies. It is little wonder that in times of economic stress funds should not be forthcoming for departments which have not attained a real dignity in the community nor quite proved their usefulness.

In these and in all times we need the interest of the philanthropist to set our health departments on a genuine foundation free from political influence and with sufficient financial backing to secure trained men. We have endowments for schools, professorships, and certain research laboratories, and abundant support for hospitals. It is time that the well intentioned who are burdened with wealth were made to feel that the endowment of local health departments, with provision that they be of a high order of personnel and equipment, would be of more real importance than the giving of money to hospitals and other means of cure. When larger taxpayers see the light, the smaller ones will.

If health departments of the old order are reaping what they have sown and getting from the public what they gave, it is time to establish departments altogether free from political influence, which will prove their usefulness, if we wish to have really healthy communities.

HEAT CALLED FOE OF ANTHRAX.

Anthrax may be prevented by sterilization, according to Alfred Seymour-Jones, of England, who addressed members of the American Chemical Society at their recent convention in New York.

"Experience has shown that with hides the only practicable method to deal with the spore is by soaking in weak acid solution," he said. "But here most common disinfectants, such as formalin and the carbolic series, cannot be used owing to their tanning action. Using mercury chloride at one to five thousand in one per cent formic acid, followed by a brine bath to pickle the hides, has proved very successful."

Mr. Seymour-Jones said that the British Government had erected an experimental plant at Liverpool, using heat and formalin, which promised good results. New Zealand had succeeded by sterilization in keeping anthrax from entering the country in animal fertilizing matter, he said.

Obituary.

MILTON HOWARD FUSSELL, M. D.,
of Philadelphia.

Dr. Milton Howard Fussell died at his home in Roxborough, Philadelphia, Saturday, October 15th, at the age of sixty-six years. He was graduated from the medical department of the University of Pennsylvania in 1884, and was a member of the faculty of that institution for many years. He was appointed assistant professor of medicine in 1901 and in 1911 became professor of applied therapeutics, a position which he held until his death. He had a large general practice, and an extensive consulting practice in Philadelphia and throughout the state. He was widely known throughout the state and greatly beloved. He was a member of the Association of American Physicians, the American Medical Association, the Pennsylvania State Medical Society, the College of Physicians of Philadelphia, the Philadelphia Pathological Society, the Philadelphia Pediatric Society and the Philadelphia County Medical Society, in whose activities he was a constant participant. He was also an active member of the boards of a number of Medico-Social and Philanthropic Agencies in Philadelphia and a member of the visiting staffs of several hospitals in Philadelphia.

News Items.

Southern Medical Association.—The fifteenth annual meeting of the Southern Medical Association will be held in Hot Springs, Ark., November 14th to 17th, under the presidency of Dr. Jere L. Crook of Jackson, Tenn.

Vital Statistics.—During the year 1920, in the birth registration area of the United States, 1,508,874 births were reported, corresponding to an annual rate of 23.7 in a thousand of population. In the same area, 836,154 deaths were reported, corresponding to a rate of 13.1 in a thousand.

New York Electrotherapeutic Society.—The next meeting of this society will be held at the New York Academy of Medicine, Wednesday evening, November 2nd, under the presidency of Dr. Victor C. Pedersen. The program will include a paper by Dr. G. Betton Massey, of Philadelphia, on Rhythmic Electric Waves in Gynecology, and a paper by Dr. Barton Cooke Hirst, of Philadelphia, on the Uses of Electricity in Conditions Peculiar to Women. All physicians are invited.

Changes in Medical Faculty at Yale.—Dr. Francis G. Blake has been appointed John Slade Ely professor of medicine; Dr. Edwards Albert Park has been appointed professor of pediatrics. Dr. Arthur M. Morse has been made full professor and head of the department of obstetrics and gynecology. Dr. John T. Peters, Jr., has been appointed associate professor of medicine, and Dr. Alfred T. Shoale, has been appointed associate professor of pediatrics. Dr. Samuel C. Hardey, associate professor of surgery, has been placed in charge of the surgical department of the school. Several assistant professors and instructors have also been appointed.

Dr. Macht Gets Award for Study on Benzyl Compounds.—Dr. David I. Macht, of Johns Hopkins University, has been awarded the third annual grant from the research fund of the American Pharmaceutical Association for his researches in connection with new antispasmodics. By means of experiments carried on at the Johns Hopkins it was found that the benzyl derivatives had all the sedative effect of the opiates without the objectionable influence of the latter, and there was no unfavorable reaction after their use. Dr. Macht will continue his work of investigating other drugs having a sedative action. The grant from the research fund amounts to the interest on \$20,000 annually.

Semicentennial of the American Public Health Association.—November 8th to 19th will be Health Fortnight in New York. A health institute will be held from November 8th to 11th; from November 14th to 19th, there will be a health exhibit in Grand Central Palace; and from November 14th to 19th the fiftieth annual meeting of the American Public Health Association will be held in the Hotel Astor. Dr. Stephen Smith, who founded the Public Health Association and who is now in his ninety-ninth year, will take an active part in the various activities of Health Fortnight. The health institute will constitute one of the most important features of the meeting. It will furnish a comprehensive course on public health matters and is not confined to members of the Public Health Association, but is open to all public health workers. The program of the section in communicable diseases will include the New Jersey State Board's Venereal Conference in Jersey City on Thursday, November 10th. Those who are planning to attend should communicate with Dr. Donald B. Armstrong, director, 370 Seventh Avenue, New York.

Personal.—Dr. Philip Rantjen, formerly professor of bacteriology at the University of California, has been elected to membership in the American Association for the Advancement of Science. Dr. Rantjen is credited with having isolated the germ causing anemia and producing an antitoxin and serum for its cure.

Miss Ettie A. Rout, London, of the New Zealand Volunteer Sisters, has been awarded the *médaille de la reconnaissance française*, in recognition of her war work as head of the Anzac Soldiers' Club in Paris, and for her services during 1920 as head of the American Red Cross depot and canteen at Villers-Bretonneux.

Professor Fedor Dessauer of the University of Frankfurt, Germany, who came to America on the invitation of the American Röntgen Ray Society, was given a dinner at the Hotel Plaza by Dr. Charles H. Jaeger, of New York.

Dr. Livingston Farrand was inaugurated as president of Cornell University on Thursday, October 20th.

Dr. Louise McIlroy has been appointed professor of obstetrics and gynecology at the London School of Medicine for Women. Dr. McIlroy was surgeon in charge of the Scottish Women's hospital at Saloniki and Belgrade from 1915 to 1919, and since then has been gynecological specialist to the Eighty-second General Hospital of Constantinople.

Pay Clinics at Cornell.—Cornell University Medical College will open a model pay clinic at First Avenue and Twenty-seventh Street. It is planned to hold the clinics every afternoon from 1.30 until 4 o'clock, except on Sundays and holidays, and evening clinics will be held on Tuesdays and Fridays until 7 o'clock. The fees will be one dollar for each visit for examination and treatment. Diagnosis of cases requiring special examination and study with group consultation and written diagnosis will cost ten dollars. The following doctors will be in charge: Medicine, Dr. Lewis A. Conner; general surgery, Dr. Charles L. Gibson; obstetrics and gynecology, Dr. George Gray Ward; urology, Dr. Edward L. Keyes, Jr.; neurology, Dr. Charles L. Dana; psychiatry, Dr. George H. Kirby; dermatology, Dr. Hans J. Schwartz; otology, Dr. Frederick Whiting; laryngology and rhinology, Dr. Harmon Smith; orthopedic surgery, Dr. Charlton Wallace; röntgenology, Dr. Lewis Gregory Cole; ophthalmology, Dr. Robert G. Reese.

Died.

ANDERSON.—In Beloit, Wis., on Friday, October 7th, Dr. Harold B. Anderson, aged fifty-six years.

BACHMAN.—In Lake Park, Ia., on Friday, September 30th, Dr. Morris P. Bachman, aged sixty-seven years.

BARTLETT.—In Clarksburg, W. Va., on Tuesday, October 11th, Dr. Meigs J. Bartlett, aged fifty-one years.

CARMICHAEL.—In Davenport, Ia., on Saturday, October 8th, Dr. Benjamin F. Carmichael, aged seventy years.

CRANDALL.—In Hudson Falls, N. Y., on Wednesday, October 12th, Dr. Charles E. Crandall, of Schuylerville, N. Y.

DENNY.—In Nassau, N. Y., on Thursday, October 6th, Dr. Eli Denny, aged seventy-six years.

FOSS.—In Dexter, Me., on Sunday, October 9th, Dr. Charles Miller Foss, aged seventy-four years.

FUSSELL.—In Williamsport, Pa., on Saturday, October 15th, Dr. Milton Howard Fussell, of Philadelphia, aged sixty-six years.

GOULD.—In Bellevue, Ky., on Tuesday, October 4th, Dr. Isaac P. Gould, aged fifty years.

HARRIS.—In Colfax, Wash., on Thursday, October 6th, Dr. John F. Harris, of LaCrosse, aged sixty-nine years.

HELM.—In Beloit, Wis., on Wednesday, October 5th, Dr. Ernest C. Helm, aged sixty-six years.

JONES.—In Atlanta, Ga., on Thursday, October 6th, Dr. Edward G. Jones, aged forty-eight years.

KERR.—In Oil City, Pa., on Sunday, October 9th, Dr. Marcus C. Kerr, of Carnegie, Pa., aged fifty-seven years.

KILEY.—In Pawtucket, R. I., on Thursday, October 13th, Dr. Edward S. Kiley, aged fifty-two years.

MCCANN.—In Brooklyn, N. Y., on Wednesday, October 19th, Dr. Charles L. McCann, aged seventy-four years.

MURPHY.—In Dorchester, Mass., on Thursday, October 6th, Dr. John H. Murphy, aged seventy-eight years.

PALMER.—In Passaic, N. J., on Monday, October 17th, Dr. C. Alanson Palmer, of Brooklyn, N. Y., aged fifty years.

PHILLIPS.—In Bar Harbor, Me., on Sunday, October 9th, Dr. George A. Phillips, aged sixty-seven years.

PYLE.—In Philadelphia, Pa., on Saturday, October 8th, Dr. Walter Lytle Pyle, aged forty-nine years.

REMAE.—In Jennings, La., on Monday, September 26th, Dr. George W. Remae, aged eighty-four years.

REPPARD.—In Middlebourne, W. Va., on Sunday, October 10th, Dr. Myron M. Reppard, aged fifty-four years.

RHOADS.—In Boyertown, Pa., on Friday, October 14th, Dr. Reuben B. Rhoads, aged eighty-nine years.

Book Reviews

ELECTROTHERAPEUTICS.

Aids to Electrotherapeutics. By J. MAGNUS REDDING, F. R. C. S., Surgical Radiographer, Guy's Hospital; Late Assistant in X Ray and Electrotherapeutic Departments, Charing Cross Hospital, etc. New York: William Wood & Co., 1921. Pp. viii-196.

In this little pocket size volume, of not quite two hundred pages, the author has attempted to provide a practical guide to the art of electrotherapy, and in a very large degree he has succeeded in his mission. It must be obvious that so extensive a subject cannot be covered in great detail in a volume of such small size as the one under review, but the author has succeeded in presenting this large subject in a tabloid form that is quite satisfactory. He takes up the different varieties of electricity from a practical viewpoint, leaving theoretical considerations aside, to be dealt with only in so far as they are considered necessary for a proper understanding of the subject. There are good chapters on ionization, diathermy, high frequency and radiant heat. The x rays receive considerable attention, and their dangers are justly emphasized. The Freiburg technic, consisting of giving a large dose of x rays through multiple ports of entry at one sitting, is quite fully described. Radium therapy does not seem to have received the amount of consideration which the importance of the subject deserves, but sufficient for all practical purposes. The volume closes with a rather large index of treatment, which must be of value to the electrotherapist.

It may be said that this little book covers the subject fully yet briefly, and contains a vast amount of information on the subject of electrotherapeutics.

A TEXTBOOK OF PATHOLOGY.

A Textbook of General Pathology. For the Use of Students and Practitioners. By J. MARTIN BEATTIE, M. A. (N. Z.), M. D. (Edin.), M. R. C. S., L. R. C. P. (Lond.), Professor of Bacteriology, University of Liverpool; Bacteriologist to the City of Liverpool; Honorable Bacteriologist to the Royal Southern Hospital, the Hospital for Women, the Samaritan Hospital, and Stanley Hospital, Liverpool; Formerly Professor of Pathology and Bacteriology, University of Sheffield, etc., and W. E. CARNEGIE DICKSON, M. D., B. Sc., F. R. C. P. (Edin.), Director of the Pathological Department, Royal Hospital for Chest Diseases, London; Lecturer on Bacteriology to the Royal Institute of Public Health, London; Lecturer on Pathological Bacteriology in the University of Edinburgh; Pathologist and Bacteriologist to the Royal Hospital for Sick Children, etc. With Two Hundred and Thirty-three Illustrations in the Text and Thirteen Colored Plates from the Original. Second Edition. London: William Heineman, Limited, 1921. Pp. xxv-496.

Textbooks are sometimes not altogether what they should be; they are even occasionally misleading. Views hallowed by tradition are set down as if they were gospel truth and new views, although they may be based on a sound foundation or at least be worthy of investigation, are passed by. There is still a great deal of conservatism in medicine and surgery and this fact is often strikingly exemplified in textbooks. Of course, conservatism is good in its way, but may be carried to undue limits when it becomes

distinctly harmful. That the pathology of textbooks should be as accurate as possible is manifestly of supreme importance. The student learns how to diagnose disease, the value of symptoms and so on largely by means of books. As a rule, he has not the opportunity to learn from postmortem examinations to a sufficient extent. This is, perhaps, especially the case in Great Britain, where facilities for the making of autopsies are limited. It goes without saying that greater facilities for postmortem investigation would be of the greatest educational value to the medical student, as well as to the postgraduate worker. However, it is painfully obvious that upon the accuracy of the textbooks on pathology the diagnostic skill of the medical man depends to a considerable extent, and it is therefore of the utmost concern that such works should be trustworthy.

Beattie and Dickson's *Textbook of General Pathology* is one that demands attention, as it differs in many material features from many books on the subject in use at the present time. It is based as to its general plan and scope on the teaching of the Edinburgh School, that is, on the methods taught by the late well known Professor W. S. Greenfield, for thirty years professor of pathology in the University of Edinburgh, and to whom the book under review is dedicated. The authors put forward in the first edition as the main excuse for the publication of the book the explanation that some of the fundamental views of the Edinburgh school of pathology, though sufficiently tested by means of experiments and experience, have been comparatively neglected. The case of infarction is cited as a proof of this neglect.

The book in its present form is divided into thirteen chapters, namely, the cell in health and disease, general retrogressive processes, necrosis and gangrene, atrophy, disturbances of the circulation, inflammation and repair, granulomata, hypertrophy and hyperplasia, neoplasms, tumors or new growths, special varieties of tumors, animal parasites, immunity, and lastly, fever. Primarily the book is intended as a textbook for medical students and practitioners, and consequently the more fundamental and important points in pathology have been dealt with, rare and unimportant conditions being discussed briefly or omitted altogether. Bacteriology as a separate subject has been left out entirely.

The second edition, which is just out, has been delayed chiefly on account of the war, the authors having served with the Royal Army Medical Corps. The whole has been largely rewritten, revised, and considerably enlarged, and the chapter on fever added. The first chapter served as a useful introduction. The description of inflammation and repair is pleasingly clear and concise, original, and up to date. Redundancy in a textbook is to be abhorred. That part dealing with tumor formation is as critical as the subject demands and is well arranged. The section dealing with disturbances of the circulation is excellent, the part treating of in-

farction being superlatively good. The chapter on neoplasms is deserving of high praise, while animal parasites are given the attention their importance deserves. As in the first edition, free use has been made of the published work of others, and wherever possible suitable acknowledgment has been made.

The illustrations are numerous and, on the whole, adequate and satisfactory, at any rate, they greatly aid in making the text clear, which, after all, is the main object of illustration. The part of the book which deals with inflammation and repair is embellished by five plates and figures from a thesis by Dr. J. W. Dawson. In the preface to the second edition a fitting tribute is paid to that great teacher of pathology, Professor William Smith Greenfield, at whose feet the authors sat and who is hailed as one of the great British pathologists, perhaps indeed, the father of modern British pathology.

The book is well arranged and is in all respects a credit to the publishers. It presents many features of originality, and is out of the common run of such books. Although some parts of it could be subjected to criticism it represents a step in advance. It may be commended to the attention of the medical profession as largely fulfilling the object of a textbook of general pathology by possessing a strong educational value and it will assist in teaching those for whom it is intended how to diagnose disease.

TABOO AND GENETICS.

Taboo and Genetics. A Study of the Biological, Sociological, and Psychological Foundation of the Family. By M. M. KNIGHT, Ph.D., IVY LANTHIER PETERS, Ph.D., and PHYLLIS BLANCHARD, Ph.D., Author of *The Adolescent Girl*. New York: Moffat, Yard & Co., 1920. Pp. xv-301.

Many of the evils of present day society are discussed in this readable volume in a sensiscientific, semipopular way. The authors attribute the majority of the evils to the conflict of the individual with the herd and to a clinging to worn out dogmas instituted in the course of human events for the protection of man or the herd at various developmental levels.

Knight opens the attack by completely repudiating so-called sexual selection. Incidentally some of the data presented will prove disquieting to the Nancy school with their far fetched suggestion and auto-suggestion which reaches the zenith of absurdity in their assertions that sex may be determined by suggestion. There is much said about inferior and superior stock. This would be far more easy to determine in the case of cattle.

The second part of the book is done in the style of Frazer who is frequently quoted. In this portion we find a well worked out presentation of taboo in regard to women. This section of the book is the most interesting in a general way. There are references in profusion. Blanchard closes the book by binding up the findings of her coworkers and showing how individual psychology as viewed from the Freudian angle has an enormous influence on forensic problems. The sources which she quotes are some of the more recent workers in psychopathology and the founders and early workers of psychoanalysis are ignored. This oversight may be due to her having forgotten the debt we owe to the founders of

analysis as well as to her enthusiasm over the books she has read most recently rather than to any intentional slight on her part. To the casual reader who is taking up the subject for the first time this may prove somewhat confusing or at least misleading. On the whole the book is a worthy one, the reading of which should prove instructive and constructive to the physician, teacher or to those interested in forensic problems and the welfare of humanity.

HISTORY OF A HOSPITAL UNIT.

History of the Pennsylvania Hospital Unit (Base Hospital No. 10, U. S. Army) in the Great War. By Colonel RICHARD H. HARTE, M. C., U. S. A., C. M. G. New York: Paul B. Hoeber, 1921. Pp. 253.

The story of the activities and experiences of this hospital unit, which served in France in charge of British General Hospital No. 16, B. E. F., at Treport, France, and also at the front, is well told in this beautiful volume by Colonel Harte. The story is a familiar one—one that has been told so often that while the thrill is absent, the story is one that commands our admiration, respect and gratitude to the men and women who went across and "made good." There is the usual story of the hospital being bombed by the Boche, in spite of Red Cross emblems and other distinguishing marks, and similar pleasantries which went to make life at the front interesting, to say the least. Humor and pathos are intermingled in this story of patience, heroism and sacrifice, a story that can be told of every unit of every description that went across. Six members of the unit, including one nurse, made the supreme sacrifice. Margaret A. Dunlop contributes an extremely interesting history of the nursing corps of the unit.

THE CHEMISTRY OF SOAPS.

Soaps and Proteins. Their Colloid Chemistry in Theory and Practice. By MARTIN H. FISCHER, Doctor of Medicine, Eichberg Professor of Physiology in the University of Cincinnati. With the Collaboration of GEORGE D. McLAUGHLIN, Formerly Research Associate in Physiology in the University of Cincinnati, and MARIAN O. HOOKER, Doctor of Medicine, Formerly Instructor in Physiology in the University of Cincinnati. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Ltd., 1921. Pp. ix-272.

The author and his associates clarify the scientific principles back of the nature and the limitations of cold and hot process soap manufacture, the empirical precautions followed when fats and alkalis are mixed to make soap, the nature of the salting out processes when mixed soaps are concerned, the relative merits of different methods of fat hydrolysis, the origins of the varying physical constants of market soaps and the nature of the action of fillers. While this is not a medical work, in any sense of the word, nor a book for the laity, the volume is written in simple language, so that even those not expert in the concepts of organic and colloid chemistry will find no difficulty in getting at the meaning of the author.

This volume ought to be of interest to the soap chemist or manufacturer, the general chemist and the physiologist or physician interested in the theory and practice of soap making and its uses. It is profusely and beautifully illustrated and the typography is of unusual excellence.

KNUT HAMSDUN.

Pan. Translated from the Norwegian of Knut Hamsun by W. W. WORSTER. With an Introduction by EDWIN BJORKMAN. New York: Alfred A. Knopf, 1921. Pp. xiv-202.

Hunger. Translated from the Norwegian of Knut Hamsun by GEORGE EGERTON. With an Introduction by EDWIN BJORKMAN. New York: Alfred A. Knopf, 1921. Pp. xii-263.

Growth of the Soil. Translated from the Norwegian of Knut Hamsun by W. W. WORSTER. Two Volumes. New York: Alfred A. Knopf, 1921.

Shallow Soil. By KNUT HAMSDUN. Translated from the Norwegian by CARL CHRISTIAN HYLLESTED. New York: Alfred A. Knopf, 1921. Pp. x-339.

In the four volumes of Knut Hamsun's work presented to us in translation through Mr. Knopf's energies, we mark an epoch in literature. It is incredible that Hamsun's writings, venerated on the Continent, should have been so slow in obtaining an audience here. As a very recent luminary on our horizon, Knut Hamsun, the personality, needs no introduction. The steady vision flaming within him, peopling the sea sodden surroundings of his youth, teaching him to seek reality, has, we are thankful to say, claimed its tardy response from us at last.

* * *

Pan is the story of an ill adjusted nature in retreat. The hero, a former soldier, lives a free animal life in the woods, hunts and fishes for his food, blends himself into the wilderness. He makes odd dashes into society from his retreat, vain attempts to put himself across. Always it is his ego craving attention. A girl is attracted to him, and he to her. They have an intermittent, unsatisfactory sort of romance that starts nowhere and gets nowhere. The cerebration of the man is that of a child without forethought or reasoning power. He shoots himself in the leg on one occasion, in imitation of the girl's lame suitor.

A disquieting sort of a book. One would like to know just what the author had in mind. There are characters enough in real life who show this startled wildness, irresponsibility, eccentricity, whatever you may call it. They are too numerous to be able justifiably to accept the whimsical phantasy of the faun god turned human.

* * *

In *Hunger* a similar character is portrayed. But here the stress of circumstance is even more galling to the hero. He lives in the city, has to work for a living, refuses to compromise his art, and passes from one degradation to another. Occasionally he sells an essay and lives for a few more days, but he is really not interested in making a living. What

he writes is not what he is told is wanted, and as he grows weaker from hunger and deprivation his writing fails him more and more. A pernicious circle and he lets himself slide, revelling in the misery. At the last gasp something unforeseen usually turns up. To accept the strange charity or chance offers him further opportunity for self pity. At the very last he casts his lot in an employment from which he cannot escape, an extra hand on a ship. With a final tragic gesture he thus banishes his art for bread, admiring himself heartily in the act! We cannot for an instant get away from the stimulating ego. And we see how in both these men their crumbling is wrought by their destructive self interest.

* * *

But in *Growth of the Soil* a life of labor and of love is devoted to construction from virgin forest, Isak makes himself a home, planning, working always hand in hand with Nature. Miraculously his land flourishes and he toils without thought of himself save as a very small benefactor. First there is stock, then more stock, then there must be larger quarters for man and beast, then more tilled land to supply food, then facilities for caring for the crops, and so on, each advance leading to something greater and more productive. He makes his plans and works for their fulfillment, making of himself an unquestioning atom in the surge of growth. His life is complete and he is alone with himself and his world.

* * *

In the first three books of the translated series, our attention has been held breathless by the characters Hamsun has projected. Thought of the writer and creator of his living personages has been but fleeting. In *Shallow Soil*, however, his majesty flashes suddenly upon one. In the other books real

life and phantasy were so deftly mingled that we lived each story, earnestly and subjectively. It became almost too intense in *Hunger* and *Pan*. *Shallow Soil* shows us the clearest reality unmingled with any emotion save what we read into it. The master's pinnacle of story telling simplicity has been reached.

A group of people is presented to us—creators in their way. The currents and cross currents of their lives, factions and interests, in short their very living goes on before us. Drama within the pages of a novel, poetry in the sheer beauty of coordination of thought, motion and picture—it is life, mercilessly, yet tenderly, above all truly, depicted. One woman finds her soul in the turmoil, another loses hers. The flock of petty thinkers matter little in spite of their pretensions. They form the shallow soil that shrivels growth of mind and body.



KNUT HAMSDUN

THE STORY OF A QUEST.

The Seeds of Enchantment. Being Some Attempt to Narrate the Curious Discoveries of Doctor Cyprian Beamish, M.D., Glasgow; Commandant Rene De Gys, Annamite Army, and the Honorable Richard Assheton Smith, in the Golden Land of Indo-China. By GILBERT FRANKAU, Garden City, N. Y., and Toronto: Doubleday, Page & Co., 1921. Pp. x-364.

These early dark evenings, warm within doors, too realistically frosty without, are well adapted to Frankau's purposes. He presents a thriller, the ever challenging story of a quest. Three Galahads are in pursuit of everlasting happiness. We note with pain that only the Peter Jameson type of Englishman is impeccable to the last. The milieu is Indo-China, a vast tropical wilderness, where Frankau's readers can never hope to journey, save with him in phantasy.

Out-Tarzaning Tarzan—glimpsing wonders anthropological, eugenic and historical, harking back even to the infinite detail of Salambo, the adventurers pass through perils innumerable. They gain the promised land where grows the flower that bears the seeds that color the world as it should be colored. But they, and we too, learn a bitter lesson. These promised lands do not stand up very well when brought to face cold fact. The ideal state is not found, idealism itself is put to rout and the adventurers win their way back to the best of all possible worlds, the familiar home country, happy to give up illusion for actuality.

Despite the instruction in the way right minded men should think and feel, *The Seeds of Enchantment* is a colorful book. An evening of delightful impossibilities is offered, as thrilling as a movie. Recommended for the whole family!

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE HORSE STEALERS AND OTHER STORIES. By ANTON CHEKHOV. From the Russian by CONSTANCE GARNETT. New York: The Macmillan Company, 1921. Pp. 312.

ELEMENTS OF FOLK PSYCHOLOGY. Outlines of a Psychological History of the Development of Mankind. By WILHELM WUNDT. Authorized translation by EDWARD LEROY SCHAUB, Ph.D., Professor of Philosophy in Northwestern University. London: George Allen & Unwin, Ltd. New York: The Macmillan Company, 1921. Pp. xxiii-532.

CLINICAL BACTERIOLOGY AND HEMATOLOGY FOR PRACTITIONERS. By W. D'ESTE EMERY, M.D., B.Sc., Lond. Director of the Laboratories and Lecturer on Pathology and Bacteriology, King's College Hospital, and Lecturer on General Pathology, London School of Medicine for Women; Formerly Hunterian Professor, Royal College of Surgeons. Sixth Edition. Philadelphia: P. Blakiston's Sons & Co., 1921. Pp. xiii-310.

DISEASES OF CHILDREN. Designed for the Use of Students and Practitioners of Medicine. By HERMAN B. SHEFFIELD, M.D., Formerly Instructor in Diseases of Children, New York Postgraduate Medical School and Hospital, and Medical Director, Beth David Hospital, Consulting Physician to the Jewish Home for Convalescents and the East Side Clinic for Children. With 238 Illustrations, Mostly Original, and Nine Color Plates. St. Louis: C. V. Mosby Company, 1921. Pp. 798.

ASPECTS OF CHILD LIFE AND EDUCATION. By G. STANLEY HALL and Some of His Pupils. New York and London: D. Appleton and Company, 1921. Pp. xiii-326.

THE TOWER OF LONDON. By WALTER GEORGE BELL. With Eleven Drawings by HANSLIP FLETCHER. London: John Lane; New York: John Lane Company, 1921. Pp. 164.

THE NEW STONE AGE IN NORTHERN EUROPE. By JOHN M. TYLER, Professor Emeritus of Biology, Amherst College. New York: Charles Scribner's Sons, 1921. Pp. xviii-310.

KRITISCHE WERTUNG DES FRIEDMANN-MITTELS. Von Dr. H. ULRICH, Oberarzt Dr. H. GRASS und Dr. S. MEYER. Mit fünf Tafeln. Leipzig: Verlag Von Johann Ambrosius Barth, 1921. Pp. 46.

COLLECTION OF LANTERN SLIDES DEMONSTRATING THE SURGICAL ANATOMY OF THE TEMPORAL BONE. With Photographs, Catalogue and Guide. By ARTHUR H. CHEATLE. London: H. K. Lewis & Co., Ltd., 1921.

AN ABSTRACT OF STATISTICS FOR THE UNITED STATES. 1920. Forty-third Number. Department of Commerce, Bureau of Foreign and Domestic Commerce. R. S. McElwee, Director. Washington: Government Printing Office, 1921. Pp. xvi-874.

LE EMPORRAGIE NELLE FERITE D'ARMA DA FUOCO IN GUERRA. Dott. GIUSEPPE FANTOZZI, Assistente e Libero Docente, Institute di Clinica Chirurgica della R. Università di Pisa, diretto dal Prof. D. Taddei. Pescia: Benedetti & Niccolai, 1920. Pp. vii-385.

MENTAL HOSPITAL MANUAL. By JOHN MACARTHUR, M. R. C. S., L. R. C. P., Senior Assistant Medical Officer, London County Mental Hospital, Colney Hatch; Lecturer on Mental Diseases to the Northeast London Post-Graduate College. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1921. Pp. ix-215.

SEX FOR PARENTS AND TEACHERS. By WILLIAM LELAND STOWELL, M.D., Fellow of the New York Academy of Medicine and of the American Medical Association; Attending Physician to New York Congregational Home for the Aged, etc. Illustrated. New York: The Macmillan Company, 1921. Pp. xx-204.

STUDIES IN DEFICIENCY DISEASE. By ROBERT McCARRISON, M.D., D.Sc., Hon. LL.D. (Belf.), Fellow of the Royal College of Physicians, London; Laureat de L'Académie de Médecine, Paris; Honorary Surgeon to the Viceroy of India; Lieutenant Colonel, Indian Medical Service. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1921. Pp. xvi-270.

THE TREATMENT OF ACUTE INFECTIOUS DISEASES. By FRANK SHERMAN MEARA, M.D., Ph.D., Professor of Clinical Medicine and Formerly Professor of Therapeutics in the Cornell University Medical College, New York; Consulting Physician to Bellevue Hospital, New York; Associate Attending Physician to St. Luke's Hospital, New York City. Second Edition Revised. New York: The Macmillan Company, 1921. Pp. 806.

TEXTBOOK OF TRACHEOBRONCHOSCOPY (TECHNICAL AND PRACTICAL). By Sanitätsrat Dr. M. MANN, Senior Physician in the Department for Diseases of Ear, Nose, and Throat, in The Municipal Hospital, Dresden-Friedrichstadt. Translated by A. R. MOODIE, M.A., M.D., Ch.B. (St. Andr.), F.R.C.S. (Edin.). With Fifty Illustrations and Five Plates in the Text, Ten Colored Plates in the Appendix. New York: William Wood & Co., 1921. Pp. 292.

SOAPS AND PROTEINS. Their Colloid Chemistry in Theory and Practice. By MARTIN H. FISCHER, Doctor of Medicine, Eichberg Professor of Physiology in the University of Cincinnati. With the Collaboration of GEORGE D. McLAUGHLIN, Formerly Research Associate in Physiology in the University of Cincinnati, and MARIAN O. HOOKER, Doctor of Medicine, Formerly Instructor in Physiology in the University of Cincinnati. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Ltd., 1921. Pp. ix-272.

Practical Therapeutics

TREATMENT OF ACUTE SYPHILITIC MENINGITIS.

BY CHARLES GRENE CUMSTON, M. D.,

Geneva, Switzerland.

The frequency with which a meningeal reaction occurs during the secondary phase of syphilis, even when no clinical evidence points to it, shows that the specific treatment must be controlled by frequent lumbar punctures, and so long as the cerebrospinal fluid presents a lymphocytosis, treatment must be continued for months or even years, as Ravaut has shown, in order to eliminate even the slightest of these reactions. By early prolonged and energetic treatment the patient will be guarded against acute meningeal accidents, but this rule has its exceptions and cases have been reported by French physicians where meningeal accidents appeared during treatment. It is also probable that the arsenical compounds do not possess greater preventive action in this direction than the preparations of mercury.

The treatment of acute syphilitic meningitis should be first a lumbar puncture, followed by specific treatment. By decreasing the tension of the cerebrospinal fluid and removing a liquid which is changed in composition, perhaps even by removing a certain quantity of virulent principles, an immediate and manifest improvement will be observed. The headaches diminish, the insomnia sometimes disappears at once, and also the vomiting. Lumbar puncture may therefore be renewed from time to time, especially if there are signs of a return of the symptoms.

As to the causal treatment, this naturally comprises mercury and the arsenical preparation. Though some observers place the iodides on the same level as mercury, it would seem that since meningitis is an accident of the secondary period, the usefulness of the iodides does not seem to be absolute, while, on the contrary, intensive mercurial treatment is decidedly indicated. Jolivet has even gone so far as to say that the iodide of potassium provokes subarachnoid edema and therefore increases the hypertension of the cerebrospinal fluid.

In France and Switzerland various methods of administering mercury have been employed. Pic and Regaud use inunctions; Widal, Boidin and Jolivet have used the biniodide; Hayem, the benzoate; Widal and Mériel used the cyanide intravenously, the daily dose varying from one to fifteen centigrammes; Claude, Lhermitte, and Joltrain, have endeavored to act directly on the nervous centres by isotonic intraspinal injections of colloidal mercury. A large amount of cerebrospinal fluid is first withdrawn and then about five c. c. of a colloidal solution is injected. Following the injection there is severe reaction with vomiting, headache, pain in the sacral region, and hyperthermia. These phenomena retrogress usually very quickly.

The prophylactic action of salvarsan and other arsenical products does not seem to be more efficacious or absolute than mercury. Their curative

action does not seem to be more rapid than that of mercury and this fact appears to have been amply proved. This action controls the accidents causing them to retrogress rapidly, but no more so than with mercury. The arsenical products do not seem to have any effect in preventing the sequelæ of syphilitic meningitis, namely, paralysis, absence of reflexes, lymphocytosis, or the onset of the Argyll Robertson sign. Of particular importance is the appearance of nervous accidents following the use of salvarsan, which have been thoroughly studied by Sicard, Jeanseime, and Ravaut, under the name of neurotropism. Consequently, Ravaut advises, in the case of meningeal accidents, that salvarsan and other arsenicals should be handled with great caution in order to avoid severe reactivation of the lesions. It may be remembered that Ehrlich advised continuing salvarsan regardless of neurotropism, which he regarded as the result of the syphilis not of the medication.

Syphilis of the Nervous System in Children.—

Edward Livingston Hunt (*American Journal of Syphilis*, April, 1921) says that in the congenital type of syphilis, the clinical signs seem to point to a more general involvement than is the case in the acquired type. The involvement of the nervous system occurs oftener in the congenital cases. Therefore the lumbar puncture becomes an essential part of the examination of every case of unsuspected syphilis characterized by nervousness, backwardness, and defectiveness. Juvenile paresis is the most frequent of all the various forms of syphilis seen in children. It is similar to the adult type. The author gives a number of case histories and presents the following conclusions: 1. The condition is common. 2. The nervous system may be involved early. 3. A lumbar puncture may be of great help and should be a routine part of the examination of every nervous child. 4. Syphilis in children necessitates a blood and spinal fluid examination of the parents and vice versa. 5. Treatment is not very promising. 6. The stigmata are not necessary nor even frequent.

Laboratory Aids in the Diagnosis of Gonococcal Infections.—

Robert A. Kilduffe (*American Journal of the Medical Sciences*, April, 1921) says of the gonococcus complement fixation test: 1. Because of the small amount of antibody produced, the reaction, when positive, is weaker than the Wassermann and may be indefinite. 2. It is frequently absent in acute, uncomplicated cases, and may not appear earlier than six weeks after the onset. 3. In acute exacerbations of a chronic urethritis the reaction is positive in about eighty per cent. of cases; in ordinary chronic urethritis with mild prostatic involvement, the reaction is positive in thirty to forty per cent. of cases. 4. The occurrence of an acute complication usually gives rise to a positive reaction. 5. A positive reaction may persist for several weeks after a clinical cure, usually lasting for two or three weeks. If obtained later than that a focus of active infection is probably present. 6.

In women the reaction is positive, as a rule, only when the infection reaches the cervical canal. According to Kolmer, in children, positive reactions occur in acute vulvovaginitis, thus evidencing that either the infection is more severe with the consequent production of more antibodies or that the cervical canal is frequently involved. 7. The reaction is positive in about sixty per cent. of pyosalpinx cases. 8. In cases of gonorrhoeal arthritis the reaction is positive in from eighty to one hundred per cent. 9. The administration of gonococcus vaccine or anti-gonococcal serum may give rise to a positive reaction which may persist for six to twelve weeks. 10. The reaction has a greater positive than negative value. It is thus seen there is wide field of usefulness for this test which it is to be hoped, will come into more frequent and common use in the survey of gonococcal infections.

Syphilis of the Trachea and Bronchi.—Philip Moen Stimson (*American Journal of the Medical Sciences*, May, 1921) says that in syphilis of the trachea and bronchi the characteristic symptoms are those of tracheal or bronchial obstruction; that is, 1, a peculiar type of dyspnea with labored, prolonged inspiration and shorter easier expiration; 2, paroxysms of excessive dyspnea, sufficient to cause syncope or even death; 3, cough, which is usually hard, brassy and paroxysmal, though quite variable in character; 4, stridulous sounds, particularly during inspiration; 5, frequently an inspiratory sinking in of the tissues of the root of the neck, epigastrium and lower intercostal spaces; 6, other features, such as more or less profuse sputum and a limitation in the mobility of the larynx. Wide variations from this symptom complex, however, are not uncommon.

Venereal Prophylaxis.—J. S. Gomez (*Military Surgeon*, July, 1921) states that the injections and intraurethral irrigations, practised today as a prophylaxis for blenorrhagia, are unnecessary and painful because the original infection of the gonococci of Neisser, which takes place in the first hours, is extraurethral. He says that thousands of disinfections practised by him and ten years later by Reid, in the English Army, by the use of only an extraurethral wash and antiseptic bathing, confirm the practicability and efficacy of the system. Syphilis and venereal chancre are avoided by this system, which is effective in both men and women. He believes that antiseptic solutions are preferable to salves, because the greases in the salves diminish the power of disinfection. Salves also change with ease, are more difficult to carry than compressed solutions, and are filthy upon application. The effectiveness of the prophylaxis diminishes greatly after the sixth hour following sexual intercourse. The salve of Metchnikoff, as well as other salves, are only effective when the genital organs are smeared for cohabitation. The user is put to great inconvenience, and therefore does not use them. Dr. Gomez says that his salve, composed of glycerin, xilol, protargol, and hermofenil, possesses more effective prophylactic properties than preparations of calomel, on account of the components being soluble. The xilol, in addition to producing great antiseptic action in depth, gives to the salve an agreeable odor.

Prostatic Hypertrophy.—Francisco Mastrosimone (*Semana Medica*, April 21, 1921) sums up a very comprehensive article by the presentation of the following axioms: 1. Prostatic hypertrophy does not always require surgical intervention. 2. The best surgical procedure is transvesical prostatectomy, in one or two sessions. 3. Occasionally subtotal perineal prostatectomy is unavoidable; in other cases Bottini's intraurethral prostatectomy by the galvanocautery will be preferred; in exceptional cases Isnardi's resection of the vasa deferentia is resorted to. 4. In prostatic cases, the patients being old, anemic, weak and toxic, more care and attention are required, both before and after operation, than in ordinary surgical cases.

Removal of Stone in the Ureter.—Oswald Swinney Lowsley (*Surgery, Gynecology and Obstetrics*, April, 1921) says that the lesson taught by this particular case seems to be that removal of stone by the perineal route should not be attempted if the stone is more than four centimetres from the bladder, and if it is not fixed in its position. Stone impacted at the point where the ureter joins the bladder wall is accessible per perineum unless the patient is obese. Provided a stone is successfully removed from the ureter by the perineal route the patient may be allowed out of bed after the second day and the downhill drainage would seem to be a decided advantage in that the chances of thick scar formation around the ureter are less. The advantages of this operation are: a. This portion of the ureter is more accessible per perineum than by any abdominal operation. b. The patient may be allowed out of bed two days after operation. c. The downhill drainage from the incised ureter prevents absorption of urine and deleterious results from concomitant infection which frequently accompanies urinary lithiasis. d. Chances of wide infection of tissues around incision in ureter and subsequent stricture of ureter are much less.

The Significance of Slight Albuminuria.—A. H. Sanford, H. M. Conner, T. B. Magath and F. J. Heck (*Medical Insurance and Health Conservation*, March, 1921), in summarizing the protocols of seventy cases of slight albuminuria, state that a definite lesion in the kidney was found in forty per cent.; a doubtful lesion in thirty per cent., and no lesion whatever in thirty per cent. While it is evident that in a large proportion of cases albuminuria is associated with kidney disease, we must admit that albuminuria in itself is of no clinical significance. In all these groups are persons who would be rejected for life insurance on grounds other than kidney disease; however, who can say, merely from the point of albuminuria, which cases would present findings which would denote real impairment of kidney function? Are all of these persons in thirty per cent. of cases with albuminuria to be excluded from life insurance merely on this account? The writers suggest, as a problem in the future for the life insurance examiner, the determination of the feasibility of widening the scope of the examination to introduce some of the newer blood chemistry methods. These methods would include blood urea and blood sugar determinations and some functional kidney test.

Changes Induced in the Kidney When an Acute Injury Is Superimposed on a Chronic Glomerulonephropathy.—William deB. MacNider (*Southern Medical Journal*, May, 1921) asserts that the existence of a chronic glomerulonephropathy renders the kidney extremely sensitive to such acutely acting nephrotoxic agents as ether, chloroform, uranium nitrate, and mercuric chloride. The acute injury induced by such agents is largely confined to the tubular epithelium. Associated with the development of the acute injury there occurs a disturbance in the acid base equilibrium of the blood which may occur prior to a decrease in renal function, as is indicated by the ability of the kidney to eliminate phenolsulphonophthalein. As the tubular injury progresses there is a further reduction in the alkali reserve of the blood which is a retention phenomenon. The tubular injury is furthermore characterized by a retention of blood urea and creatinine, and by a marked increase in the output in the urine of albumin and casts.

Fibrous Caverositis—Induration of the Corpora Caverosa.—Perry Bromberg (*Southern Medical Journal*, June, 1921) divides the medical treatment into constitutional and local, though he says that in the majority of cases no results will be obtained from either. Internal medication should consist of large doses of arsenic, mercury and iodides, and all sources of infection, such as teeth, tonsils, sinuses, urethra, and prostate should be removed or sterilized. Such complications as gout, rheumatism, diabetes, and tuberculosis, which may accompany the condition, demand appropriate care and attention. Local forms of treatment mentioned are massage, electrolysis, galvanization, ionization, local applications, radiotherapy, radium, and injections of various substances into the plaque. Massage he considers contraindicated; electrolysis benefits a few; ionization and galvanization occasionally score a brilliant result; local applications of pastes and salves are of no avail; injections occasionally give a brilliant result, but on the whole are disappointing. He advocates surgery.

Cholesterol in Cerebrospinal Fluid.—A. Levinson, L. L. Landenberger, and K. M. Howell (*American Journal of the Medical Sciences*, April, 1921) conclude as follows: Normal cerebrospinal fluid contains no cholesterol or only a small trace. Fluid in which the Wassermann and Lange reactions are positive contains no cholesterol in appreciable amounts. Only three out of twenty-five such fluids gave a reading in the colorimeter. Fluid of hemorrhage of the brain showed high cholesterol content. Fluid from tumor of the brain gave a trace of cholesterol. Fluid from a case of brain abscess gave a high cholesterol reading. The majority of meningitis fluids showed a trace of cholesterol. Three fluids had a high reading. Ventricular fluid gave no cholesterol reading except when there was the presence of hemorrhage of the brain or other pathologic condition. The Hauptmann reaction seems to depend on the cholesterol content of the cerebrospinal fluid. This work does not bear out Pighini's contention that the Wassermann reaction depends on the cholesterol of the fluid. They believe that the cholesterol content depends on the permeability of the meninges.

Urinary Antiseptics.—Edwin G. Davis (*American Journal of the Medical Sciences*, February, 1921), in a study of the antiseptic properties and the renal excretion of two hundred and four aniline dyes, comes to the following conclusions:

1. There is no known drug ideally suited for the purpose of internal urinary antiseptics.

2. Of a total of two hundred and four aniline dyes investigated sixty-one were found to possess antiseptic properties in agar, and twenty-eight of these were efficient as antiseptics when added to voided urine.

3. As regards selective action against various organisms, this property was exhibited by no less than forty-four dyes, in every case the colon bacillus proving more resistant than the staphylococci. There were only twenty-four which inhibited the colon bacillus in urine in a dilution of one to one thousand.

4. There was almost no exception to the rule that antiseptic action was exhibited in higher dilution in alkaline urine than in acid urine. Attention is therefore called to the fact that these dyes are most efficient in urine of a reaction which renders urotropin inert.

5. The azo dyes give no promise of value, since of thirty-seven of this group studied only three possessed antiseptic properties, and these only to a slight degree.

6. Of the triphenylmethanes many were antiseptic in high dilution in urine (some in dilution greater than one to one million). Of these, however, all but one were toxic and none was excreted by the kidney. This group is, nevertheless, worthy of further investigation.

7. Of twenty-one dyes of the xanthane group three were antiseptic in voided urine, and two of these were excreted to a moderate degree.

8. Of four acridin dyes two were antiseptic in urine; neither was excreted.

9. Of nine dyes of the azine group five were antiseptic in urine, and three of these were excreted by the kidney with great rapidity and completeness and were nontoxic in twenty milligrams to the kilo dose.

10. By a study of two hundred and four aniline dyes, chosen at random, it has been possible to select fifteen which are antiseptic in urine, excreted by the kidney, and which are relatively nontoxic. With only two of these (proflavine and acriflavine) was it possible to demonstrate the secretion of antiseptic urine following intravenous administration.

11. Considering that rapid renal elimination of aniline dyes is not unusual; that there are not a few dyes, relatively nontoxic, which exert a bacteriostatic action when diluted to infinitesimal amounts in voided urine; and that out of two hundred and four dyes it has been possible to select fifteen which approach the ideal and two which are experimentally effective; it is within reasonable expectation that a dye clinically suited for use as an internal urinary antiseptic may be discovered or synthesized. Experiments to date indicate that dyes of the triphenylmethane, xanthone, acridin and azin groups (particularly the latter) give more promise of value.

Proceedings of Societies

BRITISH MEDICAL ASSOCIATION.

Eighty-ninth Annual Meeting Held in Newcastle-upon-Tyne, July 19, 21 and 22, 1921.

Under the Presidency of Dr. DAVID DRUMMOND.

The annual general meeting was opened in King's Hall, Armstrong College, on the afternoon of July 19th, when Sir Clifford Allbutt relinquished the presidential chair to Dr. David Drummond, vice-chancellor and professor of the principles and practice of medicine, University of Durham.

Presidential Address.—Dr. DRUMMOND in his address as president insisted upon the right of medical practitioners to demand postmortem examinations as the only true means of insuring accuracy in diagnosis, an admittedly revolutionary suggestion which, to become effective, would require the endorsement of a public opinion at present dominated by prejudice. It was pointed out that in many cases diagnosis at present was only a matter of opinion which must remain in doubt unless cleared up by an autopsy. A prominent member of the medical profession had said to him recently that general practitioners would never be any better until they were entitled to demand, with the knowledge that they would not be denied, a postmortem examination. He contended that in urging the necessity for greater facilities for postmortem investigation in clearing up doubts which must arise in the mind of the doctor in many cases, he was indicating the most important step towards a rational scheme of postgraduate training. Dr. Drummond concluded an eloquent address by saying that he would fain echo the words of one of the world's pioneers: "Now understand me well, it is provided in the essence of things that from my fruition of success, no matter what, shall come forth something to make a greater struggle necessary." He said that considerable fruition of success was already theirs; led by courage and confidence they would triumph in many another encounter.

Presentations.—At this meeting Sir DAWSON WILLIAMS was presented with the gold medal of merit of the association, in recognition of his distinguished services to the association and the medical profession as editor of the *British Medical Journal*. Sir Dawson has had a brilliant career, first as a specialist in the diseases of children and for the greater part of his life as editor of the *British Medical Journal*. It may be said that the medal of merit was instituted by the association in 1887 and is only awarded by the council for distinguished services to the association or extraordinary professional services. Sir Clifford Allbutt presented a check to Dr. J. A. Macdonald, LL.D., of Taunton, past chairman of the council of the British Medical Association, and formerly chairman of the representative meeting, as a token of their friendship and a symbol of the gratitude they all felt for his valuable services to the association.

Mortality from Tuberculosis.—The representative meeting of the association began the preceding week when matters of considerable moment to the medical profession were discussed. One of the most interesting subjects dealt with at this meeting was tuberculosis, or rather the effect of poverty in raising the rate of tuberculosis mortality. Dr. H. Garstang, the chairman, presided. In introducing the question, Dr. B. G. Baskett drew attention to the slackening of the fall in tuberculosis mortality from 1896 onward, culminating in an actual rise in the death rate after the Insurance Act, and suggested that the council be instructed to institute an inquiry into the act dealing with the nutrition of the poor. He pointed out that the natural mortality from tuberculosis depended upon the rate of real wages. He had been studying the subject for twelve years, and had never yet found a case where a rise in the death rate had not been preceded some three years previously by a fall in real wages, nor had he seen the converse. Tuberculosis mortality was a sensitive index to economic conditions, and unless wages were raised, he declared that the death rate would not fall. If it depended upon wages, he contended that the problem for the statesman was to raise wages; in other words, by such means to diffuse prosperity.

The meetings of the sections commenced on July 20th and continued up to the evening of July 23rd. These sections will not be commented on in order, but some of the most interesting papers of the various sections will be selected for consideration.

Visceral Syphilis.—In the section of medicine a discussion on visceral syphilis, especially of the central nervous system and the cardiovascular system, was introduced by SIR CLIFFORD ALLBUTT, regius professor of physic, University of Cambridge. The paper contributed by Sir Clifford was long and within the limited space allowed would be impossible to quote at any length. Referring to congenital syphilitic disease of the heart, he pointed out that while we might guess much we did not know much. The malformation clinically known as the "blue disease" had been found in the children of syphilitics. Mitral stenosis had been attributed to the same cause by Hutchinson, Virchow, Landouzy, Eger, and others. Some of our unaccountable cases of mitral stenosis might be due to a parental syphilis as Professor Cowan's specimens suggest (*Diseases of the Heart*, 1914). So likewise of stenosis or atresia of other orifices, for example, of the pulmonary artery. Accurate differential work was needed in this field; in such cases, it was not sufficient to suspect syphilis in the parents or even to prove it; more than one cause might have been at work, as for instance, in the not infrequent association of tuberculosis and syphilis.

In the course of his paper, Sir Clifford said that while as a Justice of the Peace he was visitor of the West Riding Asylums, Yorke, and afterwards as a commissioner in lunacy, he was impressed by

the prevalence of general paralysis of the insane in cities, in seaports, and near barracks; in the rural districts it was less prevalent. If, as has been said, he was the first to guess at its syphilitic nature, it was because it is an endemic plague of such districts. It was in the West Riding Asylums that he observed optic neuritis in a certain proportion of cases of this disease. In general paralysis of the insane, of course, the cerebral bloodvessels were unmistakably diseased, with meningitis and other consequences. In large areas the virus was in great activity; the perivascular spaces were full of these products. Here again arose the question of determination; was the disease swayed this way or that by the relative functional activity of certain vascular areas according to the stresses of the individual life, or by some more inherent affinity. Opinions on this subject depended much on the sphere of practice of observers. The observer whose experience was mainly in private asylums would see cases of mental disease in the anxious brain worker; the frequenter of county asylums would see them among wage earners. In either case alcohol might be a cooperative, but not an essential factor. Referring again to congenital syphilis, he said, there was not much for him to say. The influence of congenital syphilis upon the brain of children needed public recognition. It was said that some form of nerve degeneration occurred in about forty per cent. of those who inherited syphilis. Cerebral syphilis attacked infants six months' old, children within their first year, and from the fifth to the tenth year; it was rarely postponed to adolescence.

Sir Frederick Mott thought that an inherited immunity might gradually die out and the individual become susceptible to mild forms of the affection, even to paralytic dementia. Of the effects of syphilis in children only too much was seen in the cripples and dullards of the outpatient departments. The universal perivascular infiltration and the ensuing arteritis were well seen in these various cases and in encephalitis neonatorum, a sort of precocious paralytic dementia. He had not seen necropsies in children but in them gumma, particularly at the base of the brain, seemed more frequent than in adults. The masses were likely to caseate and resemble tuberculous lumps, but they were more matted into the surrounding structures. It was said that if not too far gone, these syphilized arteries might recover, that degenerative changes have been observed in them. This was not unlikely and might explain the prompt clinical improvement when active treatment had been started before much thrombosis and atrophy had ensued. Here came the appeal again for early treatment; for recognition of the incontinent invasion of the system as septic diffusion set in. Why then might not affections of the central nervous system be expected to vanish under systematic treatment, as readily as, say, those of the nose and throat? It was true that in the one case the virus was less easy to get at than in the other, but with the new means of intrathecal attack, these fastnesses should be no longer inaccessible. If intrathecal medication must accompany the intravenous from the early weeks of the malady, and it was coming to this, he

thought, then in view of the terrible consequences menacing the patient for his next quarter of a century, there would be no longer a limit to our therapeutical means. The cerebrospinal fluid must be tested at short intervals till it became permanently negative. Syphilis could evade intermittent and precarious treatment better than any other virus. The following is a summary of the conclusions reached: 1. That the syphilitic process might be seen in little in the primary sore. 2. That wherever it was found it consisted in a lympharteritis with consequent irritative and atrophic effects. 3. That the division of syphilis into time periods, as primary, secondary and tertiary, was based upon superficial characters and was misleading. 4. That the pyrexial phase, slight as it might be, indicated a general syphilitic sepsis, in which the cerebrospinal process was soon involved. 5. That early necropsies had shown that in the pyrexial phase, the aorta, brain, liver and other viscera became infected; and that the cerebrospinal system did not long escape. 6. That lumbar puncture should be made soon after the onset of the pyrexial phase and the cerebrospinal fluid tested from time to time parallel with the blood testing.

Syphilis in the Male.—Dr. ROBERT W. MACKENNA dealt with the treatment of syphilis in the male and raised the following questions with regard to a number of points that seemed to him to be of considerable importance and upon which there is some divergence of view as well as of practice. 1. Whatever the remedies employed, was it better to give large and progressively increasing doses over a short period, or small doses at very short intervals? 2. What were the best methods of introducing remedies? a. Mercury; should it be given intramuscularly, by inunction or by the mouth, and if given intramuscularly, were soluble or insoluble preparations the best? b. Salvarsan; should this be given intravenously or intramuscularly or by a combination of both methods, and what considerations should influence the choice of the route? 3. What is the rôle of potassium iodide in the secondary stage of the disease? 4. Can the precise parts played by salvarsan and by mercury in the treatment of the disease be defined? Do their actions overlap, and how do they differ? 5. Should both remedies be used separately or simultaneously? 6. Was there any ground for the opinion that salvarsan used without mercury might aggravate the type of syphilis, and by damaging the nerve cells predispose to what the French call neurorecidives? 7. Does salvarsan used alone tertianize, that is, advance the date of incidence of tertiary symptoms? 8. In the presence of persistently positive Wassermann reaction of the blood serum and of the cerebrospinal fluid, what course should be adopted, all other symptoms being absent? 9. Should treatment be continued, with a patient who has had no symptoms for twelve months, and who has given a consistently negative reaction during that time in both serum and cerebrospinal fluid? 10. What number of injections of salvarsan and mercury should constitute a course; and what is the smallest gross dosage that should be aimed at in the first course? 11. On what facts should opinions as to cure be based? 12. Are there

reasonable grounds in the light of modern experience, for promising a patient who is willing to persevere with treatment and who comes in the secondary stage of the disease, but is otherwise healthy, that he can be cured. 13. In the presence of a consistently positive serum reaction in a man who has been well treated, and who has had no symptoms for two or more years, is permission to marry justifiable? 14. Can any permanent success be hoped for by treating incipient cases of general paralysis of the insane or tabes with salvarsan and mercury; and how should these drugs be used in such cases? Have intrathecal injections of salvarsanized serum justified the continuance of their use.

Syphilis in Women and Children.—Dr. WALTER C. SWAYNE, professor of obstetrics, University of Bristol, read a paper on syphilis in women and children. He summarized as follows: 1. There were greater difficulties in women than in men, owing to the frequent failure of the patient to detect symptoms in herself. 2. A large number of those affected contracted the disease innocently. 3. Women were, on the whole, more likely to act as innocent carriers than men, especially of extragenital infections. 4. Diagnosis was, on the whole, more difficult with women than with men. 5. Treatment was often interfered with by home duties, conditions of employment and frequency of parturition. 6. The special social and family surroundings of women made the disease, in their case, more difficult to deal with and, perhaps, of more importance than in the male. 7. A large proportion of women suffering from syphilis came, sooner or later, into the hands of the gynecologist for the treatment of various pelvic affections.

Asthma and Allied Disorders.—Sir HUMPHREY ROLLESTON, K. C. B., read a paper on asthma and allied disorders. He said that in opening the discussion he proposed to speak largely but not exclusively of asthma, and should not discuss the hypersensitiveness to certain drugs as its mechanism was probably the formation of a new foreign protein. Ten years ago asthma was regarded as a reflex neurosis and the sole reference to the present day opinion was contained in Dr. A. G. Gibson's introductory address at the meeting of the British Medical Association in 1911. He said: "Many of these cases, for which no cause can be found, manifest a rhythm or periodicity, as if some chemical material were stored up in the nervous centres and exploded at the end of a latent period. It is possible that modern theories of anaphylaxis, may, in the future, aid us in our understanding of the reasons which lead to the perpetuation of such a rhythm." Rolleston pointed out that Meltzer defined bronchial asthma as a phenomenon of anaphylaxis. From the other point of view, Sir James Mackenzie in his *Symptoms and Their Interpretation* insisted on the principle that the vast majority of the symptoms of disease were disturbances of normal reflexes, maintained the frequency with which asthma was the outcome of reflex stimulation from the nasal cavity and other parts of the body. He also regarded "cardiac" asthma as clinically similar to spasmodic asthma and due to an insufficient supply of blood to the respiratory organs. But an-

other and more attractive interpretation was put forward by Sir Thomas Lewis and his coworkers that the phenomena were due to a nonvolatile acidosis caused by defects in renal function invaded by acid products in such amounts as to endanger life.

Dr. L. C. Walker, of Boston, considered that although neurotic conditions were often associated with asthma they did not deserve a place as a genuine cause, and that though cardiac and renal patients might have true asthma, these were entirely independent coincidences. Rolleston pointed out that Dr. Hurst had recently given a much more inclusive definition of asthma as the reaction of an overexcitable bronchial centre to blood borne irritants and to peripheral and psychical stimuli. The author asks whether, leaving aside the cases of cardiac and renal asthma, we are in a position to exclude a reflex explanation of some cases of asthma and to consider that they are all due to hypersensitiveness. It was suggested that among the cases of asthma in which there is no positive skin reaction a large proportion are those arising comparatively late in life and associated with infection of bronchial tubes, asthmatic bronchitis.

It was pointed out that even if a vaccine does good it might be interpreted to act by merely removing a reflex cause. The precipitation of an attack by smelling an artificial rose, is difficult to explain on any grounds, other than psychical stimulation. The importance of heredity in the etiology of asthma was emphasized, as was also the fact that hypersensitiveness might be acquired. So far as the influence of season is concerned, it was pointed out that asthma confined to the summer was usually hay fever due to sensitization to pollens. Winter asthma was usually due to bacterial infection, and hay fever in the summer might leave behind it bronchitis and bacterial asthma, so that the patient suffered all the year round. As for vaccine treatment, the results appeared to depend on whether the patient gave a positive skin reaction to the protein of an organism which was then administered, or whether reliance for the choice of the vaccine had to be placed on the predominant organism in the sputum or other discharge.

Rolleston thought that the points for consideration were as follows: 1. Is all asthma, excluding cardiac and renal dyspnea, due to hypersensitiveness, or is there a residue of true reflex asthma? 2. Is there a metabolic asthma due to autosensitization? 3. Is hypersensitiveness, apart from that due to injections of serum, ever acquired *de novo* and without an underlying inborn tendency? 4. What is the relation of asthma associated with bronchial or other infections and not giving positive skin tests to these more characteristic cases in earlier life? 5. What percentages of normal persons who have never had any clinical manifestations of protein sensitiveness give positive skin tests? 6. Limitations of the skin tests; the reasons for failure, antigen unrecognized or altered in preparation; local sensitiveness; desensitization by an attack. 7. Treatment; specific; limitations of subcutaneous desensitization of alimentary sensitiveness; nonspecific peptone treatment.

(To be continued.)

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Miscellany.

Importance of Eye Examinations in Nephritis.—Adolph O. Pfingst (*Southern Medical Journal*, May, 1921) urges the frequent use of the ophthalmoscope in all cases in which kidney trouble is suspected. Early retinal changes are often visible in general arteriosclerosis and chronic nephritis even before a uranalysis would reveal anything to indicate a kidney lesion.

Neutrophilic Myelocytes in the Cerebrospinal Fluid of a Patient Suffering from Myeloid Leucemia.—Lewellys F. Barker (*Southern Medical Journal*, June, 1921) reports one case in which it has been possible during life to demonstrate in the cerebrospinal fluid the presence of cells of leucemic origin, the only one yet described. In the few instances in which lumbar puncture has been done in leucemia the cerebrospinal fluid has been negative, or has merely shown a trace of blood or an increase of globulin.

Viability of Spirochæta Pallida in Excised Tissue and Autopsy Material.—George R. Lacy and Samuel R. Haythorne (*American Journal of Syphilis*, July, 1921) say that they became interested in the question of occurrence of *Spirochæta pallida* in dead tissues, when actively motile spirochetes were found in the blebs and organs of a stillborn congenitally syphilitic infant which had been kept in a refrigerator twenty-six hours prior to the autopsy. They conducted experiments in order to determine the time during which the *Spirochæta pallida* remained alive in dead tissue, the criteria being the motility of the organism and its ability to transmit the disease to a new host. The following is a summary of their results: Spirochetes kept in serum or moist tissue may retain slight motility as long as three months or more. Reliable dark field exam-

inations can be made on tissues or fluids collected several hours previously, provided they are kept moist and cool. Complete drying is probably fatal to the *Spirochæta pallida*, since in each of the rabbits used by the experimenters syphilitic lesions failed to develop when inoculated with dried spirochetes. This was in accord with the work of Neisser. *Spirochæta pallida* might remain virulent in autopsy material for twenty-six hours or longer.

Experimental Syphilis in the Rabbit.—Wade H. Brown, Louise Pearce, and William D. Witherbee (*Journal of Experimental Medicine*, April, 1921) describe lesions affecting the facial and cranial bones, cartilages, and the bones, tendons and joints of the feet, legs, and tails of animals with experimentally induced syphilis. Most of the lesions were instances of periosteal, perichondrial or bone involvement, and a few lesions only were recognized clinically in which the origin appeared to be tendons, tendon sheaths, etc. Grossly the lesions were of two types, one being a circumscribed, indurated, and nodular mass, and the other a more diffuse process. Histologically they gave the typical appearance of syphilitic granuloma, composed of more or less distinct layers which corresponded roughly with structural divisions of the periosteum. Invasion of the bone with absorption and necrosis occurred constantly in periosteal affections. Lesions in the bone and marrow cavities were detected chiefly by radiographs, or by the occurrence of bone destruction in the absence of periosteal involvement. Detailed descriptions are given of the general character of the lesions, their histology, and the gross alterations produced in the bone. Clinical aspects of syphilis of the skeletal system, and syphilis of the posterior extremities with other affections of a miscellaneous type are also dealt with.

Severe Illness Due to Ascarides.—Gaudier and Cleuet (*Gazette des praticiens*, May 1, 1921) report the case of a woman, aged twenty-eight years, who had epigastric pain for a week, during which she grew pale and weak, and was thereupon admitted to a hospital. Her face was waxy, pulse small, temperature 38.6° C., abdomen somewhat distended and tender, especially in the hypogastric region. There was slight, malodorous diarrhea. The facies suggested a septic condition, and typhoid infection was thought of. Next morning she suddenly grew pale and almost pulseless, with a temperature of 37.2° C. and the abdomen tender and rigid. With the thought that a perforation might have occurred, an emergency laparotomy was done under light ether anesthesia. A little serous fluid issued from the peritoneal cavity and the small intestine was congested, especially in the terminal portion of the ileum. Nothing else being found, the abdomen was closed, and saline solution administered. During the night the patient vomited ten specimens of ascaris and discharged two more by rectum. Another ascaris was passed the next day, and two grams of thymol yielded three more, after which the stools became negative for ova. Repeated typhoid and paratyphoid agglutination tests were negative, but the blood showed a six per cent. eosinophilia. She was discharged cured one month after admission.

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The Man Galen and His Times

By JONATHAN WRIGHT, M. D.,
Pleasantville, N. Y.

The times into which Galen was born and the position he occupied in social life and an allusion to the importance he has for his medical posterity must in this account of him take precedence of the incidents, which, though it is impossible to be sure of their actual sequence in chronology, unmistakably mark his personality, as revealed to us in his works. One does not progress very far in the study of Hippocratic medicine before the need is felt of taking a jump of about six hundred years and knowing about the works of Galen. I do not propose here to go into an earnest discussion of these but rather to make a study of the man Galen in his training for his life work. This cannot be done for Hippocrates, because he was a different man. He was not so eaten up with vanity as to foresee that the world would ever care about his personality. He was purely objective and impersonal and we are the losers thereby in an historical sense. The works of Hippocrates are full of the accounts of his failures in treatment and diagnosis. One finds no fatal cases in Galen's reports of his practice. Puzzled by some passage in Hippocrates, Galen exclaims: "Why bother with the text, the patient died." So absorbed was Hippocrates with his work rather than with himself we need the light which the volubility of Galen throws on the works and are grateful for the little he throws on the person of Hippocrates. The justification of the charge of garrulity brought against Galen is appreciated by any student who undertakes to become acquainted with his work in an exhaustive way. Its enormous mass was turned into Latin from the Greek by Dr. Carolus Gottlob Kühn, to whom we may ascribe an iron determination and an industry scarcely less remarkable than that of Galen himself. This Herculean task he began after he was sixty-two years old and brought to a triumphant conclusion (1) in less than ten years.

There is no other source from which to draw information about the man Galen except from the works of Galen, all the works, for notices of his personality are scattered here and there and one must pick and patch and put it all together if one is to know how this one man did so much to perpetuate the ancient medical lore in the world of his

time and hand it down to posterity, for what we know of more ancient medicine from other sources, while not negligible of course, altogether is comparatively small. If we should add to the works themselves of the Hippocratic Corpus all we learn of other medical writers before the time of Galen and all we can glean from Plato and Aristotle and Theophrastus, even from Oribasius and Ætius, of medicine before Galen, the whole would not equal what Galen alone tells us of medicine before his time, not to mention what he contributed himself, which is huge. We could almost construct Hippocratic medicine out of what Galen alone says of it. This mighty mass, scarcely less perhaps than four or five million words, is the chief source also of the medicine from which after the renaissance our medicine sprang. He was no less distinguished for the volubility of his discourse than for the fertility of his pen. In the former he showed the characteristics the younger Pliny (2) ascribed to the inhabitants of his native land over which Pliny was a proconsul of Trajan. The Bithynians, he says, like most Greeks, are prolific in words and chary of deeds—*plurimis verbis, paucissimis rebus*. Galen wrote such a large number of philosophical and medical works, according to Athenæus (3), that he surpassed all his predecessors and we cannot demur at the further eulogy that he could take rank with any of the ancients as an expositor, since he so far excelled them in copiousness at least.

Any one who attempts to write the history of medicine, past or present, can no more pass over this huge bulk than he can circle the earth and miss the ocean. He must go through it. With the exception of small islands here and there, like the translations of Daremberg (4) into French and the recent translation of Brock (5) of one book into the English of the Loeb Classics, the sole refuge for the reader from the Greek text is the limping Latin of Kühn, twenty-one bulky volumes each averaging almost a thousand pages of the original and the translation, badly proof read, and, I fear, not free from blemishes of other kinds.

Out of this great mass of discourse, not absolutely confined to medicine but having a sprinkling of philosophy and its history, what can we learn of

the man Galen? It is said that genius is the power to work intensely. If we are to agree to this the possession of genius cannot be denied to Galen, for nothing but an enormous assiduity¹ would have left such an output behind him, loaded on the demands of an active practice in a large city even when supplemented by the leisure of an occasional withdrawal from it. With one small exception none of his contemporaries, either lay or professional, so much as mention him. We must accept his estimate of his own powers when brought into competition with his fellows. If pertinacity and industry, which we must attribute to him, raised him above mediocrity, as it so often does in our more energetic age, we know it only from himself. It is quite evident, and he appreciated the fact himself, that the circumstances of his early life were eminently favorable to success in that which has made him a great figure for us. It is plain, as to this, that these in combination with an innate energy of character and even a mediocre mental endowment quite suffice to explain what he left in writing, if we have little proof as to its efficiency in marking him among his contemporaries as a commanding figure.

If this is the conclusion we are driven to, I do not know where one is to turn for another example so striking of the triumph of circumstances of character and training over the circumstances of the times and above all over the circumstance of time. Indeed, Galen was almost if not quite the last medical man who has any claim to originality at all in the ancient world, and he ruled the medieval world for more than a thousand years. Despite his prolixity, and his commonplaces, perhaps partly because of this garrulity, he dragged his hero, Hippocrates, at his chariot wheels through a world sunk in ruin, to the renaissance. For all that time to the world he was a mightier man than the mightiest mind of all medical history. That is what fate, luck, not genius, does for a man's fame. As Boswell for us is more interesting, as that astonishing literary personage alone makes Johnson, the leviathan of his day, bearable to us, so Galen sung the praises of Ypocras to the Dark Ages, and the indiscriminating taste of those rude centuries thought the servant the equal if not the superior of the master. Boswell was nothing to his contemporaries. To posterity he was the greatest fool and the greatest biographer who ever put pen to paper. Galen is neither of these things to us, whatever he may have been for his contemporaries, but when we attempt to seek out from others the personality of Galen we find him, it is true after the lapse of a vastly greater stretch of time, more obscure than even Boswell. Even Asclepiades, the Bithynian, was a friend of Cicero though Galen thought him a charlatan, but he seems to have had a better claim to originality than his critic, while his heresies seem no more wrong to us than the fallacies of his more orthodox fellow countryman.

Galen was the physician of probably the best and wisest ruler who ever reigned and of his son Commodus who was perhaps the worst. He seems so

well acquainted with their cooks (6) he might be accused of having arrived at the sick chamber by way of the scullery stairs, except he specifically gives other accounts of it. As the exsurgeon to the gladiators at Pergamus we even might be pardoned for suspecting that thus he kept the favor of Commodus, who dragged the purple of the Cæsars in the dust of the arena, but he tells a different story. He relates in glee the anecdote of his triumph over the cooks in his quarrel about the heart of an elephant, slain in the circus, which he kept long after at home to show the bone in it. He swells with pride as he says many of the gladiators died before he took charge of their health and their wounds at Pergamus but none afterwards (7). But on the whole the little we can gather from his account of his daily life in Rome can scarcely be taken for any more than a hint of the degradation of the middle class. There can be no doubt that Galen belonged to people of wealth and culture but history tells us that this does not at all mean that they stood high in the social scale in the time of the Antonines, despite the example of Marcus Aurelius. Doctors a hundred years ago in England entered the servant quarters on their way to high placed patients. These considerations are not entirely out of place in a discussion of the question, why little or no record has come down to us, in the general literature of the times, of such a man as Galen, but that is trivial. Nothing will ever be heard of the names which loom so large in our professional eyes today with the lapse of an equal time.

What is vastly more curious is that there is no mention of Galen in such contemporary professional literature as we have. I do not know of any until the time of Julian, the Apostate, by whose shining mark in history we date his chronicler Oribasius. This was probably two hundred years after Galen's death, but there is said to be a contemporary notice of him by Alexander Aphrodisiensis, mentioning him as a philosopher and a doughty disputant, the Mule's Head, he called him. Cælius Aurelianus does not mention him and neither does Aretæus. This we might explain by placing them earlier than Galen, but to suppose that Galen would not have mentioned them if they had preceded him is improbable. They may have all three been contemporaries it is true, but it does not entirely explain the lack of mutual acquaintance. It is difficult then to see on what ground Sprengel bases his opinion that in the time of Oribasius Galen was regarded as infallible. Paulus Ægineta, probably much later, refers (8) to him as standing on the same footing as Oribasius, indeed he mentions him after Oribasius in his preface.

It seems probable that the social standing of physicians fell after the Augustan age. According to Suetonius, Julius Cæsar (9) conferred Roman citizenship on professors of the liberal arts, especially physicians, that he might induce others to seek the city. Augustus (10) expelled slave dealers, slaves and prize fighters, who were foreigners, but made exceptions of schoolmasters and doctors, the implication for the reader being the latter in the estimation of the public in the time of Suetonius belonged in the same category. Suetonius is supposed to have

¹ To what extent this could be carried in a previous generation may be seen in the striking account by Pliny the younger—*Epistularum* III, 5—of the industry of his, for us, more famous uncle.

been born shortly after the birth of Nero, perhaps in 70 A. D. His contemporary and friend Pliny, the younger, bears the same testimony (11). He begs from Trajan citizenship for Harpocras, an Alexandrian, manumitted from slavery in Egypt, who had cured him of a very severe illness. However, it is necessary for us, familiar practically with a very degrading form of slavery only two or three generations ago, to guard against prepossessions in adjudicating the social status of slaves among the ancients.

Cato had written a so-called book on medicine and the book of Celsus is the sequel to one on agriculture. After the advent of the Greek culture in Rome, medicine became a trade apart from "what every gentleman should know," if only to keep his slaves serviceable, and under the Emperors around the court many of them were little better than poisoners or men kept there to detect poisoners.

Eudemus, the paramour of Livia, the wife of Drusus, was one in the reign of Tiberius (12). This Eudemus was of course not the one Galen knew so well, but Galen himself succeeded an antidote mixer for Marcus Aurelius (13). At least, except in this way, they ceased to interest political circles and literary men, the satirists as well as the historian chiefly referring to them thus. Whatever his contemporary standing in the profession and whatever the social status of physicians after the period in which Greek genius had placed the school of Alexandria on a height, it seems safe to say that an appreciation of Galen's talent first rose to the point of mistaking it for genius several hundred years after his death.

In seeking to know the man Galen, then, we are thrown back on his works, on what he says of himself. No county atlas, no compendium of "distinguished" physicians ever allowed its contributors to go so far in selflaudation. Athenæus speaks (14) in this vein: "Except the doctors nothing could be sillier than the pedantic grammarians," he says, quoting some of his guests and speaking of a play (*Mendax*) by an ancient Athenian. "Great is the sophist and the cook in Sosipater is in no way inferior to the boastings of the doctors." Things apparently were not different in the day of Galen. His actual portrait is lacking because of the lacking of the engraver's art. We do not know what the "Mule's Head" looked like, but otherwise his character stands forth in many an anecdote he relates of his prowess in debate, his infallibility in diagnosis, his oracles in prognosis, his marvels of therapy.

But like Æneas he was a pious man on his own showing, far better he honored his father, and far worse he spoke evil of his mother. He was a cad, a prig and a grind. He was studying Hippocrates when he had better have been reading Horace, though he was learned in Homer, probably from student days in Alexandria. Though not born with a very healthy body (15), having in childhood and adolescence suffered from some more or less severe illnesses, he had never had any "fevered buboes," and when he was twenty-eight years old he became convinced, though since his early years he had devoted himself night and day to strenuous study, that he could by careful regimen preserve his health. But

for an occasional attack of fever this he succeeded in doing. It was when he was seventeen that his father had a dream which decided him to make a physician, instead of a philosopher and a rhetorician, of his son, whom he had already indoctrinated with the stoic opinions of Chrysippus (16). Despite his priggishness there is no denying the enormous service he rendered, not alone to the history of medicine, but to the science of anatomy in his research work by experimental methods, especially in neurology. Of all things, however, the world is most grateful to him, and out of this arose chiefly his posthumous fame, because he handed down to subsequent generations of benighted men the words and meaning of Hippocrates, Plato, and Aristotle. He honored himself in humbly bowing before Homer and the mighty shades of these men, but he too plainly placed himself next their thrones in his own estimation, and yet so great are his services to us we need not begrudge him this vanity, for in truth the station he really occupies is that of the second greatest name in the annals of medical history.

It is thought the year of his birth was about 130 or 131 A. D., in the beneficent reign of Hadrian—in a reign when almost the whole known world, as Gibbon remarks, was enjoying the blessings of peace among men, and for a longer time than it has ever enjoyed it since, it may be added. He was born in Syria, the son of Nicon, a gentleman and a scholar, if we are to believe filial tenderness, an engineer and a mathematician, a philosopher, a friend of learning, and apparently a man of wealth. His grandfather and great grandfather were also men of learning (17). "Fate dealt kindly with me in giving me the best and most benevolent of fathers. What I am by nature I hardly know, since my father devoted himself to making me by training the best and most attractive kind of man he could" (18). Galen seems to have been very well satisfied with his father's labors and fully recognizes what circumstances did for him at any rate. His father taught him all he knew and instructed him in the doctrine of Chrysippus and the other noted stoics, on which in his youth he wrote many exercises, but in which he seems to have found much to criticize in later life. "I had surely a father," he declared, "who achieved the highest distinction in geometry, architecture, logic, arithmetic and astronomy. He was praised by those who knew him for justice, honesty, and moderation above all philosophers" (19). He was something of a dietitian, we also learn, experimenting on the various soups and ptisans and the ways of preparing them, his son assisting. Galen was born probably and lived, in his boyhood, in Bithynia near Prusa (20) and this seems to have been his home until he was twenty-one when his father died, though he was away at Alexandria, Smyrna and elsewhere in his student years subsequently and practised in Pergamum nearby before he went to Rome the first time. He boasts of the purity of his Greek tongue (21), though he is at no pains to conceal his prejudice against the Attic dialect and the philosophy of Athens of his day in many passages. He declares he has always dwelt in an atmosphere of books and asserts he has never been accustomed to conversa-

tion with hucksters, cooks or publicans—differing in this way as in others from Socrates, on the whole, for the worse.

We get some idea of the kind of a country house they lived in. So unchanging is the East it reminds us of the house of Odysseus (22), in which the wooers of Penelope met their fate, though Galen's home apparently had no upper chamber. Some of its features are biblical and occasionally described as still existent. As you enter the door you see in the middle of the room a fireplace and connected with it the ovens for baking. Beyond these and also facing the door, for there was no chimney, on the interior wall, is a raised chamber for guests with seats. On the side walls are stalls for cattle. On each side of this "drawing room" are bed chambers and along the upper part of the walls of these are arranged, all around, cupboards for all sorts of things. After the wine had fermented in casks and had been tightly corked in bottles, his father used to place it in these recesses to age it. The hay mows and the granaries were evidently on the sidewalls above the stalls, exposed also to the warmth of the fire in the cool weather. The roof did not extend over the centre of the room apparently which thus made the dwelling essentially one around a small court with colonnades, at least in places, to support the roof. An opening to the sky is the natural and pleasantest thing in the balmy southern air of the Mediterranean. His father's farm was situated facing the sea between Pergamum and Elea. "There is a hill, covered with thyme from which the bees make the most delicious honey. This hill is at the left as you go from Pergamum to Elea, not however near the road" (23). Beyond the hill lies Mysia. We quite catch the spirit of the beautiful verse Murray has made out of a strophe in the Iphigenia at Taurus of Euripides, so often quoted:

"Give me the little hill above the sea,
The palm of Delos fringed delicately,
The sweet young laurel and the olive tree,
Grey leaved and glimmering."

No wonder that for Galen yearning for the hill-sides of his youth no other field, even in nearby Mysia, produced such honey, even though they said the Mysian was like the Attic honey. They had no such sweet flowers to feed their bees upon as grew in the sod his boyish feet had pressed. Looking back in his old age after having known, as he said (24), all manner of men, even the emperors, and the wickedness of the world, he may well have realized that all is vanity but that.

Asia Minor in the time of Galen was indeed a land of milk and honey—a promised land, which it might have been thought of old worth forty years' wandering in the desert to enter, where grapes grew to monstrous proportions, granaries groaned with the harvest, and treasure of all kinds for long periods lay open to the horrid rapacity of brutal Roman proconsuls. Cæsar, according to his own account, carpeted Gaul with the dead. We say he made a desert and called it peace, but out of the welter of nations a great civilization arose. The slaughter of human beings, so attractive to human beings, cannot destroy civilizations. Out of the soil springs life ever anew. Apparently that was

not the result in Asia Minor after the Roman dominion. Cosmic changes seem responsible for most of it but man did what he could. Cicero, Sallust, Tacitus tell us of the sordid and brutal rule of Rome and that the provinces of Western Asia were the ones its two legged wolves most quarrelled about, but the thorough scrapings of further Gaul and even combing the forests of Germany could heap the platters of but a few. They took what they could and there was more to go round in hither Asia for Sulla and Lucullus and Pompey and Crassus and Piso and their countless imitators, but before the Byzantine power was at its height a mightier devastator, the hand of Nature herself, apparently began her work.

From this point of view Galen had every reason, as an Asiatic Greek, to look with contempt on the rocky and barren shores of Attica, but he even decried the supremacy of her dialect and at times seemed blind to the traditions of her ancient glory, so bitter was the rivalry between the sophists of Athens and those of Pergamum in his day. The influence of purely Athenian culture was then in decadence. Philosophy, poetry, even the material arts had their chief seats in the maritime cities of Africa and Asia, whence the sages and sophists of the Academy and the Lyceum at Athens had derived them. In Galen's day they had already returned to the fruitful soil from which Athens and the rock-ribbed isles of the Ægean had transported them. Attic supremacy for all its still unapproached glory was short lived. A few generations and the high tide of the human intellect washed back to the sands along the eastern littoral of the middle sea. In the best era of that backwash and in the cradle of præ-Attic civilization Galen was born and trained. Circumstances, not only of personal affluence but the vastly more important ones of cosmic pulsation, both terrestrial and intellectual favored him. Man had done his worst and still the land bloomed as before. Under the Antonines, as earlier under Trajan, it had wiser and better rulers, perhaps the very best it has ever had. Under them Galen and his father lived in peace and plenty. He was born not in the stews of Rome nor beneath the crumbling façades of Athens but in the centre of the land of the Asian renaissance, close to Pergamum, whose library had been despoiled by Anthony, it is said, but he could not, even for the smiles of the Egyptian sorceress, remove learning and culture from Smyrna and Antioch with cases of parchment and papyrus rolls to the shelves of Alexandria. We must keep this atmosphere in mind.

Had the feeble murmurs of the new religion reached the hillsides where the sweet thyme grew in the fourth decade of the second century? There can be no doubt of it. Thither, to rule over Bithynia and Pontus, a generation earlier Trajan had sent Pliny, the younger, who found the problems raised by the new doctrine rising and confronting him. Had Nazareth and Bethlehem any significance in the education of our apt and omnivorous scholar, as he learned the precepts of the stoics from the lips of his father? They were provincial towns, far away to the south, and if the father and son had heard of them, as doubtless they had, they, too, may have

thought no good could come out of them, but Galen, the son, bore a brand of piety throughout his life which was nearer Christianity than the stoic writers of an earlier age could have taught him. The saints, Ignatius, Polycarp, Irenæus, Justin Martyr, were already bearing their testimony by the middle of the second century after Christ. We hear of St. Polycarp and St. Irenæus at Smyrna (25) during Galen's boyhood. It was there, where Galen studied, that Polycarp was burned at about this time. In a comparatively small city, though larger, he says, than any Hippocrates ever saw, burning even one human being would have been a thing a young man would hear of, and Galen, perhaps with such scenes in mind, remarks on the obstinacy of the Christians. It is quite evident from his maturer works that he had, at least in his own later life, diverged markedly from the orthodox traditions of the Athenian epoch. Pliny told (26) Trajan he did not know what to think or do with the Christians or what to ask them, though he had tortured two women to find out the truth. In Bithynia the old temples were deserted and the cattle dealers, who supplied victims for the sacrifices, were loud in complaint. Better leave them alone, Trajan said; don't investigate, unless some one complains and then, if the case is manifest, they had better be punished—with death probably, "but these charges after all are not the worst samples of our age."

Twice in the books on the differences in the pulse Galen refers to the obstinacy and mysticism of the Christians. You cannot take for granted what is laid down in medical theory, "without explanation as though it had to do with the sect of Moses and Christ" . . . "they will more easily depart from their principles than the doctors and philosophers from their chosen tenets" (27). Most of the fathers of the church were born later than Galen, but if Galen wrote this book, he knew of Christ.

At any rate a new ethical feeling which was a part of the deep underlying thought even before Christ, was veering toward modern standards. Even in the classical *præmium* of Celsus, in the discussion of human vivisection we get some note in it, but if we go back of Galen five hundred years to the time of Hippocrates we get more exclusively the earlier signs of intellectual progress rather than those of Christian ethics. It was one of discrimination and differentiation in accord with the law of the evolution of thought. When the later Hippocratic author in the *Sacred Disease* attacks the charlatans, he comes out plainly and says there are different processes to use in discussing things divine and things terrestrial, but for the author of *Airs, Waters and Places* there is no celestial body as separated from the terrestrial body. All diseases for the more ancient writer are divine, one not more nor less than the other. Of course we bold successors to the martyred iconoclasts see in this declaration there is nothing supernatural about the origin of disease or anything else. That may have been the thought of Hippocrates but that is not the way he put it, for obvious reasons.

The old pantheistic methods of thought of primitive man still prevailed and the best he himself dared to do was to declare epilepsy a disease like any other

—all of them divine, if you will. This recurs in a more uncompromising form in some of the books supposed to have been transliterations of Hippocratic thought by his successors before Galen's time. The words had been heard before and doubtless heeded, "Render unto Cæsar the things which are Cæsar's and unto God the things which are God's." We can take note of the same sentiment in the Christians who bothered Pliny. Galen remarks the assertions of Moses and Christ may need no proof, but it is different with the pulse. If you have a theory you must have a valid demonstration of it, but this clarity of discrimination between things divine and mundane things does not appear in the thought attributed to Hippocrates II at all, full of irony as much of his writing is. Now this is one of the significant things about Galen's early training, about the training, evidently, of so many of the medical writers after Hippocrates. In Galen it may have lain at the root of the endless, tireless, tiresome, garrulous, futile effort to reason things out, hurling anathema at the empirics but not admitting that he himself was a dogmatist. This is a characteristic we perceive in much which Galen quotes from this literature often in derision, often in support of his own assertions, no less prolix and puerile.

While it is not difficult for a fuller analysis to trace out divergence of thought between the essentially Greek and the later oriental Græco-Roman tendencies of thought, it is scarcely possible in the time of Galen to find any influence of the ethical tendencies which were inaugurated or at least greatly advanced by the advent of the new light of Christianity from the east. Modern humanitarianism was born at Bethlehem and though the ultimate change was to be so much greater it was not noticeable in the time of Galen. The shifting of ways of thought toward transcendentalism, begun before the Christian era by the Neoplatonists, brought in its wake the shifting of ethical ideals beyond the path traced by the stoics, but this was in the lap of the future, the practical application of them, very far in the future. The old dispensation was the one under which Galen was born and lived. The torture of the slave to make him reveal the crimes or even the ideas of his master was alike a character of ancient Greek and of later Roman law—the torture of innocent human beings in order to expose his guile or save the master from the clutches of the law. Galen exhibits in his writings the stoic instruction of his early life. He emphasizes the necessity of restraint of the passions in the prevention and treatment of disorders of the mind (28) and diverges into much ethical application of the regimen.

It is, however, not the altruistic but the individual application, not a word of compassion for human suffering, not as much as we can find in the *Præmium* of Celsus, not a sign of a revolt from the exhibition he makes of inhuman cruelty in contemporary manners. He comments in a detached tone on the degrading effect angry passions, vented on the slave, have on the master, the loss of dignity and the weakening of his character, when he beats him with his fists, with clubs, with sticks, lacerating the unhappy creature with the sword and chance instruments of torture. He tells of masters seizing a pen

and jabbing it into the slave's eye—one of these monsters was one of the better kind of Roman emperors—Adrian, in whose reign Galen first saw the light. He was filled with shame and mortification, not because of the torture of a human being—not at all; it was because he had lost his self-control and given way to passion. So to humiliate himself, to palliate his own feelings of lost respect, he told the slave he could ask him what he liked in the way of recompense. The slave was silent. Galen says he was afraid for his other eye. It was not the emperor only who could safely, as safely as a mob with newspapers behind it, venture to indulge in fits of unbridled fury. He speaks of journeying with a comrade, perhaps as physician to one of the four hundred, whose acquaintance he had made at Rome. The man gave way to such a fit of passion for a trivial fault of a slave, laden with his attire, who followed on foot, that he beat him with a sword. The slave was so maimed and bled so the journey was interrupted at the Isthmus of Corinth. Again Galen describes the remorse of the stoic, not on the slave's account but on account of the stoic's precious feelings of self-respect.

Cæsar knew by running up the figure of the dead in his commentaries on the Gallic wars he was appealing in the most moving way for popularity to the ferocity of the Roman mob. Galen himself was physician to the gladiators in Pergamum. As in secular literature so in professional works in medicine we seek in vain for any evidences of pity and compassion. They must have had them in some degree for we have them and they were as human if not as humane as we. It is not an integral part of the germ-plasm of human nature to pity the weak and succor the needy. It is a somatic graft from an intellectual evolution. We easily brush it aside and can be as beastly as they, more beastly than the beasts. The beasts only kill for food not for sport and the excitement of adventure. It was not the fashion for the human beast to be kind in the time of Galen. It is the fashion now despite the decline in religious feeling, but it had its beginnings in the intellectual changes of the early phases of social organization as well as in the happening on Calvary a hundred years before Galen's birth. It was influenced, too, in the Roman empire, by the gradual increase in the number of slaves of education and ability in the ancient world. The enfranchised slave and the freedman had memories deep in their souls which told for social revolution and the success of a new religion. If cruelty lingered in the world of Galen undiminished and still unmodified by the rise of a new religion on a ground prepared for it, partly by changes in the methods of thought and partly by the political and social changes of the west, we find superstition and the mysticism of primitive life more firmly rooted in the East, for some reason not well understood, another factor in the preparation of the ground for the new faith and this still more plainly we take note of in the works of Galen (29), the Asiatic Greek. On one of its manifestations hung the fate of Galen's profession in life. Though trained for pure philosophy by a father, who was not only a philosopher but a learned man, the latter's dream told him that his son must study medicine.

This Galen alludes to many times (30). It was hardly due to this so much as to his own mysticism and to the mysticism of the East generally that Galen was more devoted to dreams than Hippocrates. There is a spurious book in the Hippocratic Corpus tacked on to another treatise, *The Regimen*, which is as foolish as anything in Galen. Indeed there is no reason why Cos, so near to the mainland, should not have been as open to orientalisms as the mainland of Asia Minor, except for differences in the extension of the hegemony of oriental despotisms which visited Cnidos at the formative period more heavily than the Isle of Cos, where tradition has it Hippocrates passed his early life under the tutelage of the priesthoods of Æsculapius, hereditary in his family.

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[NOTE.—The references to the works of Galen indicate the Kühn edition, the Roman notation for the volume, the Arabic for the page.]

The Diagnostic Value of Pupillary Symptoms in General Disease*

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Quite recently a lady consulted me to ascertain why her pupils were so small, stating of her own volition that she knew they did not react to light, and that she had already consulted two or more other doctors without obtaining any further information. Examination revealed typical Argyll Robertson pupils; both were small, one smaller than the other, neither reacted to light, both reacted to accommodation. After tests of the knee jerks and for Romberg's symptom, she stated that neither of these tests had ever been made upon her before.

This was not a poor, illiterate patient, but a highly intelligent, well to do lady living in New York city, and it is presumable that the doctors whom she had previously consulted are accustomed to a high class practice. How they could have failed to appreciate such plain evidence, especially after it had been called specifically to their attention, is beyond my power to tell. One can hardly believe it possible that any doctor at the present time can fail to recognize or to appreciate the bearing of an Argyll Robertson pupil, yet the history of this case seems to show not only the possibility, but the actual occurrence of such a failure at a very recent date.

This incident impelled me to write a brief and imperfect account of the diagnostic value of certain pupillary symptoms with a view to presenting it to an audience of general practitioners, and it is with much hesitancy that I presume to present it. But it seems pertinent for me to raise the question whether we are doing all we can to extend the knowledge of the diagnostic value of symptoms which occur in the domain of our specialty. Right here let me protest against the rather prevalent idea that doctors generally are indifferent to what an ophthalmologist may have to say. A few years ago, when called upon to discuss the paper of a colleague before a group of general practitioners, I took the opportunity to urge them to look, to make accurately certain observations which would enable them to make the diagnosis with ease. After the meeting my colleague said to me: "What was the use of telling them that? Not one of them will ever take the trouble to look." That view is wrong, I firmly believe. Some general practitioners know the relations of the eye to the rest of the organism quite as well as we do, many more know them to some extent. Granted that there remains a minority of the careless and selfsufficient whom we cannot reach, are we not in danger of shooting over the heads of those who wish to learn in our discussions of matters of scientific interest to us, so that our words are dry and meaningless to them, and of going to the other extreme and dealing out the veriest pap when asked to present papers to general practitioners? My experience has led me to believe that most practitioners earnestly wish to increase their diagnostic powers and eagerly gather up the crumbs

of what seems to them wisdom which may fall from our lips. It is therefore in the hope of reaching some of them through you that I present this, which you may consider a morsel of pap.

The pupils are ever changing in size because of the varying conditions of light and accommodation, but we can recognize at a glance whether they are abnormally large or small, and whether they are equal in size. We can also appreciate the fact when pronounced changes have taken place in them without apparent cause. We must know how to test the reactions of the pupils to light and to convergence or accommodation, and be ever ready to make these tests when attention has been called to the eyes. These tests are very easy to make. Cover the eyes for a few moments to accustom them to the dark and allow the pupils to dilate; then cast a bright light into one eye and observe the contraction of both pupils. The contraction of the pupil through which the light is cast is called the direct, that of the other pupil the indirect or consensual reaction to light. Both must be observed because sometimes the consensual is present when the direct is not. To test the reaction to accommodation or convergence, either name may be used indifferently, have the patient look far away into the distance, then have him focus his eyes suddenly on a finger held four or five inches away directly in front of them, and watch the pupils contract. No matter whether the pupils are dilated, contracted, or unequal, no diagnosis can be drawn from their condition without taking into account these two reactions, together with whatever other symptoms, either local or general, may be present.

Let us suppose that both pupils of a person apparently in fair health are widely dilated. The cause of this mydriasis may be in the eye itself, in the body at a distance from the eye, or it may be psychic. If he is totally blind, neither pupil will react to light or to accommodation, and some explanatory lesion probably exists in the eyes. This lesion, when found, may prove to be a symptom of some past or present organic trouble in the central nervous system, or it may be purely local. If both pupils respond directly to light, neither eye is totally blind. If vision is good for distance, but bad for near, and there is no reaction to light or to convergence, we first have the patient look in various directions and observe whether any of the muscles which move the eye up, down, or inward are paralyzed, for this combination of symptoms would indicate an affection of the oculomotor nerve, quite likely due to a lesion in the brain. Should these muscles function normally, we have to investigate whether the mydriasis dates back to a traumatism which ruptured the sphincters of both irides, whether by some chance a cycloplegic has been instilled into the eyes, and whether the patient has recently recovered from a sore throat. When the last mentioned possibility proves to be the case, a diagnosis of postdiphtheritic

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paralysis is pretty safe. If the pupils react to accommodation, though poorly or not at all to light, the presence of tabes is suggested very strongly, but we must remember that possibly the patient is suffering intense pain, as from colic, or he may be under the influence of some strong emotion, like fear or anger, or have psychic trouble, all of which may cause the pupils to behave in this manner. The reflex mydriasis induced by powerful sensory and psychic stimuli may be so strong as to be able to overcome the contraction of the pupils induced by the strongest light we can employ, so an absence of the light reaction in patients thus suffering does not necessarily indicate the presence of an organic change in the central nervous system. When the reactions to both light and accommodation are prompt we need to question whether the sympathetic nerve may not be irritated by some lesion in the neck, or in the mediastinum. In a child the cause may be intestinal worms. When the patient is very sick or unconscious, the presence of mydriasis is not likely to be of much diagnostic value.

The opposite condition, myosis, may be due to an inflammation or irritation of the eyes, which is usually evident, or to the instillation of some myotic, like eserine or pilocarpine. When the pupils are equally contracted, we are likely to think of chronic poisoning by opium or one of its alkaloids, the patient being supposed to be in fair health, but the contraction may have been caused by a ciliary spasm following prolonged near work, by hysteria, or by a paralysis of the sympathetic nerve. Should the reaction to light be lost and the pupils contract still more in accommodation, the cerebrospinal system is affected and tabes should be considered.

It goes without saying that if one pupil alone is dilated or contracted, the pupils must be unequal. Therefore inequality of the pupils should not lead to a hasty diagnosis of tabes. If one pupil alone is dilated and responds consensually but not directly to light, we know that eye to be blind, although the reaction to convergence is normal. If the eye is not blind and the dilated pupil refuses to react to light, either directly or consensually, or to accommodation, we have to investigate with regard to a past traumatism, an instillation of a cycloplegic, and an intracranial lesion. If it reacts to light, we think of a possible lesion that irritates the sympathetic on the same side, or involves the oculomotor nerve. When one pupil is contracted with no explanatory irritation or inflammation of the eyes, and when no drops have been instilled, or when both pupils are contracted to an unequal degree, our first thought is of tabes, but this is not present if the pupils respond to light in a normal manner. In the majority of cases the light reaction will be found to be either slow or abolished, and then we know that there is trouble in the central nervous system. In rare instances unequal pupils with normal light reactions are congenital and physiological, but we should not permit ourselves to make this diagnosis until after every possible affection of the sympathetic nerve has been excluded. Sometimes the cause of such an anisocoria in a child may be found in a swelling of the bronchial glands on the same side with the larger pupil, and, as such swellings are usually tuberculous

the anisocoria in those cases may be said to be an early symptom of tuberculosis.

The reactions to light and accommodation may both be slow or abolished at the same time. The pupils are then usually dilated. Such a condition may be caused by a lesion situated in the sphincter of the iris, in the short ciliary nerves, in the ciliary ganglion or its motor roots, in the trunk of the oculomotor nerve, or in the ganglion cells of the nucleus of the sphincter. We can get some assistance in locating the lesion by the instillation of a drop of eserine into the conjunctival sac; if the drug produces its ordinary effect on the pupil, the lesion lies farther back than the ciliary ganglion, while if its effect is slighter than it should be the lesion is either in or in front of this ganglion. This absolute immobility of the pupils is met with in cerebral syphilis, occasionally in general paresis, less often in tabes.

More frequently we meet with the reflex immobility of the pupils, in which they react slowly or not at all to light, either directly or consensually, although they respond promptly to accommodation. This is the Argyll Robertson pupil with which we started. The pupils may be dilated, contracted, or normal in size, equal or unequal. Their predominating peculiarity has just been stated, but they also fail to dilate in response to sensory and psychic stimuli. Such a condition leads us at once to search for other signs of tabes, but it is not absolutely pathognomonic of this disease. It occurs occasionally in general paresis, and is said to have been met with in some other cerebrospinal diseases. The pupils often are irregular, and sometimes the iris becomes atrophic with a consequent weakening of the reaction to accommodation; in such cases the pupils simulate more or less closely the condition of absolute immobility.

Once in a great while our attention may be arrested by queer behavior on the part of the pupils. First one and then the other will dilate and contract from no apparent cause, or they may dilate and contract together. The first is called alternating mydriasis, the second hippus. Both are indicative of trouble in the central nervous system, but, as this paper is not intended to be exhaustive they may be passed by along with various other reflexes of the pupil which have been the subject of considerable study, but are as yet of little value in diagnosis.

We must admit that the behavior of the pupils, taken by itself, is an unreliable guide to diagnosis. The pupils may be dilated, contracted, or normal in acute and chronic alcoholism, as well as in other kinds of poisoning, and their reactions may be increased, decreased, or not affected; their condition depends on the quantity of the poison taken, the nature of its action, the stage of its action when we happen to see the patient, and the latter's susceptibility. The same uncertainty of pupillary behavior exists in meningitis, most intracranial troubles, psychoneuroses, and many other diseases. Nevertheless, observation of the pupils, when taken in conjunction with the other symptoms present, frequently proves a very valuable aid in the diagnosis of general disease.

106 CENTRE AVENUE.

The Ocular Factor in Headache

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The symptom for which an ophthalmologist is most frequently consulted is headache. The ocular factor in all forms of headache is greater than is generally supposed, probably not less than forty per cent., while of all bilateral frontal headaches, seventy-five per cent. are due to eyestrain. Headaches due to eyestrain are invariably bilateral; the hemicranias are not commonly due to eyestrain.

In the study of headache, the site, the character of the pain or distress, the time of day of its occurrence and greatest severity, the character and amount of employment of the eyes, and the state of the general health are the important determinations for the ophthalmologist.

The site of the headache, when eyestrain is responsible, is often misleading as to the character of the existing error of refraction. In a general way, a frontal or supraorbital headache indicates a hyperopic error; occipital, an imbalance of the extrinsic ocular muscles, and temporal, an astigmatic error. When headaches occur in more than one locality, a combination of refraction error is suggested—for example: headache occurring in frontal and temporal regions at the same time foreshadows a hyperopic error combined with an astigmatic one—compound hyperopic astigmatism. Variations from these rules are not infrequent, however.

The character of headaches due to eyestrain is usually dull, sometimes boring on excessive use of the eyes, seldom knifelike. Toward the end of the day headache due to eyestrain is severest in patients who use the eyes continually, especially for close work; and in this particular it differs from headaches that most nearly stimulate them, which are due to diseased conditions of the nose and its accessory sinuses. These, as a rule, are worse on arising and lessen as the day advances, and probably can be accounted for by gravitation and collection of secretion in the lying posture during the night, with a gradual distribution and elimination of these accumulations during the day.

At a time when a patient is much reduced in health, or is convalescent from a long standing or febrile disease or a major surgical operation, asthenopic (eyestrain) symptoms or other remote distresses, the result of errors of refraction are apt to become manifest. In good general health the effort necessary to overcome an existing error of refraction or extrinsic muscular imbalance may give no reflex headaches nor other distresses, but when the eye musculature, consisting of the ciliary muscles of accommodation and extrinsic muscles, is weakened through constitutional disturbances that tend to lower vitality—the same use of the eyes, which when in health, produce no untoward symptoms, at this time is attended by the reflex headaches that are characteristic of eyestrain. Examination at this time under a mydriatic is advis-

able, and when there is found an error of refraction or extrinsic muscular imbalance, relief is usually experienced when they are corrected. However, if he has been wearing glasses, the original symptoms may recur, which his lenses were prescribed to correct. An examination under a mydriatic and glasses containing the present correction, will nearly always clear up the complaints when they are found to be due to errors of refraction.

Because a patient is wearing glasses is no evidence that the correction is what it should be at the time he seeks relief. By questioning, one will frequently find that the glasses he is now wearing were ordered without the use of a mydriatic and sometimes he is wearing a correction which, although it has been estimated under the effect of a mydriatic has now been changed by time or by a lowered state of health.

Abnormalities in the shape of the globe, particularly the short eye of the hyperope and the irregular curvature of the cornea in the astigmatic or combination of the two defects are usually hereditary, and are responsible for the majority of headaches due to eyestrain. By wearing glasses containing the accurate optical correction relief is usually experienced.

If, however, an imbalance of the extrinsic muscles is associated, the problem requires more careful consideration. The methods employed for relief depend upon the personal equation of the ophthalmologists, which experience best brings. It is often a fastidious point to decide just what measures suit each case, as many factors are to be considered. Imbalance of vertical extrinsic muscles give more pronounced headaches than imbalance of the other muscles that are concerned in the movement of the eye. A lateral imbalance up to six prism diopters may not give symptoms, but an error as low as one prism diopter of vertical imbalance is often responsible for many complaints, and requires careful added attention. Such discrepancies are much more likely to produce other reactions: vertigo, nausea, and symptoms the result of remote reflexes.

The patient's description of his headache should be noted, and too much pains cannot be taken in getting details of the complaints. Given a patient suffering from headache, with a suspicion of an existing error of refraction, an estimation of the correction under a mydriatic is always indicated up to fifty years of age.

Quite frequently a patient suffers from headache that has every semblance of that due to eyestrain with no external evidence of inflammation, and upon examination and tests has no refraction error present. In a number of these cases, by turning the lids and carefully scrutinizing the conjunctiva, it may disclose changes from loss of lustre to de-

cided disease. In this type of cases the complaint most generally heard in addition to headaches, is drowsiness that occurs in the afternoon. As a matter of fact, many who have applied for relief of headache had thought they required glasses, but examination determined the cause to be conjunctival disease. In this vicinity conjunctival affection producing headache is quite prevalent. The symptoms disappear as a rule as soon as the conjunctiva has responded to a course of treatment. Headaches due to glaucoma, iritis, keratitis, conjunctivitis and other diseases that attack the eye structures and adnexa are readily recognized as presumably causative by the affection when found.

Hemicrania is usually a symptom when intra-ocular tension (glaucoma) is present, and an ophthalmoscopic examination of the fundus of the eye in all migraine subjects should never be neglected, because it reveals occasionally a cupping of the optic disc, the result of tension, even when there is no external evidence of this disease.

A careful ophthalmoscopic examination of the

fundi of the eyes is imperative in every patient who complains of headaches that are persistent and uncontrollable. By such examination many of the brain tumor cases admitted to our hospitals disclosing choked discs are diagnosed as such for the first time. An ophthalmoscopic survey of the fundi of the eyes often discloses changes in the structures that suggest anemias, arteriosclerosis, toxemias and other dyscrasias which might be held accountable for headache.

Not one of the routine determinations of the many that go to make up a complete eye examination should be omitted when a headache patient consults for relief, and if our best efforts are not sufficient to allay the distress entirely, advice should always be given the sufferers to seek for possible source elsewhere, and I find that colleagues in general and other special practice seem to be of the same mind, because they recognize not infrequently that more than one element may enter into the causation.

127 WEST FIFTY-EIGHTH STREET.

Mobilization of Bony Ankylosis of the Knee Joint—Arthroplasty*

By CHARLES OGILVY, M. D., F. A. C. S.,

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Mobilization of bony ankylosis of the knee joint, or arthroplasty of the knee joint, has been one of the most difficult problems the orthopedic surgeon has been called upon to solve. A number of attempts have been made, but these have in the majority of cases proved unsatisfactory and disappointing. In some instances reankylosing of the joint has

motion has been obtained for a few months only and the joint has become practically stiff again within a year or two. In others, very slight motion of a few degrees is reported. In another group of cases, free motion has been obtained at the expense of the stability of the joint, with the result of marked lateral motion and a final result simulating a flail joint.



FIG. 1.—Showing solid bony ankylosis of knee joint before operation.



FIG. 2.—Showing solid bony ankylosis of knee joint before operation, anteroposterior view.



FIG. 3.—X ray taken ten months after operation showing new joint formation.

taken place immediately after the operation, without any motion whatsoever being obtained. These are classed as complete failures. In other cases, some

The reasons for failure are numerous. First, the anatomical structure of the joint offers reunion of bone over an extensive surface and also tends to the production of the strong fibrous contracture of the capsule. Second, weightbearing is essential and

*Read at a meeting of the Orthopedic Section of the New York Academy of Medicine.

this means upward of two hundred pounds pressure upon the joint surfaces, which predisposes to re-union. Third, the crucial ligaments are no longer present to maintain the stability of the joint in extension. The lateral ligaments also are often sacrificed by the operation, so that if free motion is obtained a very unstable joint is provided. Fourth, no tissue for interposition that has as yet been employed has been entirely satisfactory in providing the necessary conditions for perfect joint function. A number of materials have been employed for the purpose of arthroplasty.

"The first successful interposition was apparently made by Helferich (1) in 1893, in a case of bony ankylosis of the temporomaxillary joint, in which he used flaps of temporal muscle. The use of muscle flaps then came into general use by Lentz, Henle,

Rochet, Hoffa, Nélaton and others. Gluck (2), in 1902, used a skin flap. Chlumsky (3) and Hoffa (4) used nonabsorbable materials, e. g., zinc, rubber, celluloid, silver and layers of collodion, while Orlow has even employed metal plates. Murphy (5) used pedicled fascial flaps; he believed that his pediculated fascial flaps led to the formation of a new joint cavity which he called a bursa, analogous to the normal embryological development of a joint cavity. Kirschner (6) demonstrated the practicability of free fascial flaps, and he showed that they require little nourishment and remain viable when transplanted into various tissues. Baer (7) advocated the use of chromicized pig's bladder."



FIG. 4.—Showing limb in weight bearing position after operation.

From Albee's *Orthopedic and Reconstruction Surgery*.

A report of the following case is prompted by the fact that notwithstanding the presence of a solid bony ankylosis of four years' duration, the operation has produced a practically normally functioning joint, with free flexion to a right angle, no lateral motion and perfect stability, which allows the patient to continue her ordinary activities without any handicap.

The technic of the operation differs in some respects from previous operations described and this undoubtedly has been a determining factor in the good result obtained.

CASE.—The patient was admitted to the New York Post-Graduate Hospital and the following operation was performed: A tourniquet was applied high up on the thigh. A semicircular incision was made extending from the outer condyle of the femur, sweep-

ing downward through the patella ligament and round again up to the inner condyle. This flap, including the patella, was laid backward and the ankylosed joint surfaces exposed.

There was the slightest indication of a line of demarcation of the joint on the anterior portion of the



FIG. 5.—Showing amount of free flexion after operation.

external condyle. The internal condyle of the femur, however, and its adjacent articulating portion of the tibia were united as one and no line of demarcation of the old joint could be distinguished.

With a very thin half inch wide chisel, curved on the flat, the new joint was chiseled, in as close approximation to the old as could be judged. First the outer half of the joint was freed and then the inner. No bone was removed as is advised by

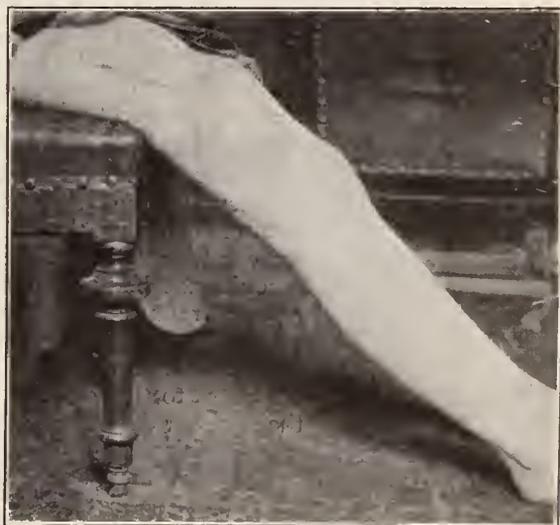


FIG. 6.—Showing limb in full extension after operation.

Putti, as this, in my opinion, tends in part to cause instability of the joint subsequently.

The joint was then flexed, bringing into view the new lower surface of the femur and likewise the upper articulating surface of the tibia. These surfaces were then carefully smoothed, first with a fine

bladed chisel and secondly with a large curette until a very smooth surface was obtained. The capsule, with its adjacent structures, was found to be closely adherent to the femur, especially that part of the capsule representing the external and internal lateral ligaments. These were stripped away from the femur to a point which permitted of flexion to a right angle. Beyond this it was not deemed advisable to force the joint. Too frequently the lateral ligaments have been sacrificed in order to obtain more motion. This has also been the cause of subsequent instability of the joint and both the external and internal lateral ligaments should be preserved as far as possible.

The joint was then ready for the interposition of the fascia flap. This was obtained from the outer side of the thigh. A flap of fascia lata the size of one's hand, with the adjacent fat, was removed and carried carefully with forceps to the joint, with the fascia side upward against the lower cut end of the femur. This was retained in position by two sutures, one on the outer side of the joint, fastening it to the external lateral ligament on the outer side and the other to the internal lateral ligament on the inner side. The limb was then straightened and the patella ligament reunited with chromicized catgut No. 2. The deeper structures were brought together by a continuous chromicized catgut suture, No. 1,

and the skin sewed with a continuous plain catgut suture No. 1.

A plaster of Paris cast was applied, with the leg in full extension. This was allowed to remain on undisturbed for two weeks. At the end of this time the anterior surface of the plaster was removed and the knee was lifted slightly out of the cast. Passive motion of this kind was continued during the next two weeks. Partial weightbearing was allowed one month after the operation and from that time on active and passive motion with massage was carried out. The patient was able to walk without the aid of crutches two months after the operation.

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40 EAST FORTY-FIRST STREET.

The Treatment of Fracture of the Femur

By WILLIAM HADDEN IRISH, M. D.,

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Nowadays there is not much excuse for malunion or loss of function in the vast majority of cases of fracture of the femur, whether simple or compound. I shall divide these fractures into three main classes, according to the portion of the femur in which they occur, namely upper, middle, or lower third fractures.

FRACTURES OF THE UPPER THIRD OF THE FEMUR.

Whether these fractures occur through the head, the neck, through the trochanters or below, the treatment is very much the same. It would be a very young child indeed, who could not be treated the same as an adult. This type of fracture in the aged I shall discuss later.

In the very young child, a plaster cast is applied from the lower border of the ribs to the toes of the affected side, and below the knee on the sound side, only when one is absolutely certain that the fracture has been reduced and the result is as near anatomically perfect as may be expected. It must be a plaster cast that holds the parts where they are placed by the surgeon. The less padding there is the better will be the result and the less risk of a pressure sore. The plaster casing should be as thin as possible and evenly applied. When properly put on one should be able to see all the contours covered by the plaster reproduced in the plaster surface. If this is done one makes doubly certain that there will be no mistake with a resulting calamity.

In older children and in adults the ideal treatment is on the Jones abduction frame (Fig. 1). One must have a frame that fits the patient and not try to make the patient fit the frame. The padded portion should be covered with the best leather and stuffed with properly picked lamb's wool. The movable limb of the splint may be abducted as far as necessary, as it is hinged at a point corresponding with the hip joint.

Application of the splint.—Extensions are applied to both legs, taking care that they clear the malleoli and do not rub them. The patient is now put on the frame, and the groin strap, on the sound side, is fastened. The foot supports are fastened to the bars of the splint and the extensions are tightened. The injured member is abducted and the extensions are retightened. The extension on the sound limb is to prevent the tilting of the pelvis. Care should be taken to see that the pelvis is square and level on the splint. Cotton wadding under the limb will protect it from the metallic parts of the splint. When the limb is in the proper degree of abduction, the splint is fixed by the butterfly nut in the bar. When the limbs are in the proper position they are bandaged to the bars of the splint and the feet are supported by extensions from the sole and dorsum, fastened to the foot supports.

Care should be taken that the injured leg is externally rotated sufficiently to prevent deformity.

The amount of external rotation necessary will be signified by the radiograph. The failure to see to this point is one of the grave mistakes often made in treatment of fractured femurs. There is an external and not an internal rotation of the upper fragment and the lower fragment must not be rotated internally as many suggest. In this splint the limb is visible, thus allowing the surgeon to observe whether the position is correct and if not to manipulate with very little discomfort to the patient. A plaster casing would have to be removed and thus undo all of the good possibly done. Other splints are not as efficient, except for one type of fracture which will be discussed in due course. The treatment of the limb and fracture after the commencement of union will also be discussed later.

Those compound fractures of the upper third of the femur with extensive destruction of the buttock and soft parts on the posterior aspect of the limb, such as are seen in modern warfare, are best treated in the Sinclair net bed (Fig. 2). The fracture can

be treated efficiently and the wounds dressed without disturbing the fracture and with comfort to the patient. The component parts of the Sinclair net frame are:

A wooden frame six feet six inches long and four feet six inches wide, with a transverse bar three feet from the head end, the umbilical bar.

There are two leg abduction bars from the transverse bar to the lower end adjustable at either end. The head and side of the frame and the leg bars are studded with round headed screws at intervals of an inch and a half, for the purpose of



FIG. 1.—The Jones abduction frame, showing the leg bar in the straight position.

attaching the netting. The foot of the frame is pierced with holes for the purpose of attaching the extensions. From the lower end of the body net are two cords to the foot of the frame for pulling the lower edge of the net under the buttocks. A body sling and pulley arrangement for the patient to support himself while using the bed pan or having his wounds dressed, and a handle to lift his shoulders. The frame is slung from a four poster.

Preparation of the patient.—The body net is spread out on a hard table and covered with a blanket folded twice, on top of which is a draw sheet folded once. The leg nets are put in a position of abduction and covered with one thickness of cotton wadding. Extensions are applied to both of the patient's legs and suspensions to both feet. The patient is then placed upon the padded net. The frame, held by two orderlies, is then lowered over the patient till the crossbar touches the umbilicus. The abduction bars are usually placed in the posi-

tion of full abduction and are fastened. The extensions are fastened to the foot of the frame, and the body net is then fixed to the frame and the leg nets to their corresponding bars. The cords from the body net are pulled down so that they hold the net well under the buttocks. The frame with the patient in it

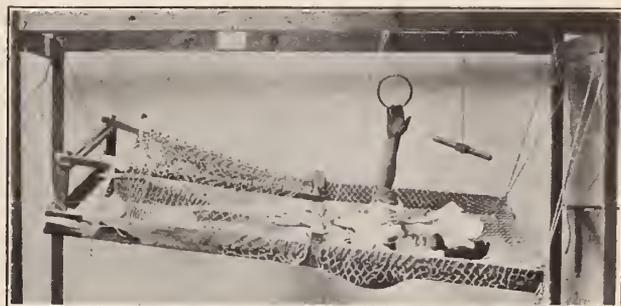


FIG. 2.—Sinclair net bed, showing the apparatus in application.

is now lifted from the table and slung in the four poster, the head lower than the feet. When slung, the umbilicus should be four inches from the transverse bar and the patellæ four inches from the leg bars. The amount of extension is in ratio to the degree of tilting of the frame. The amount of tilt used is usually the head twelve to eighteen inches lower than the foot. Eighteen inches tilting will reduce most of these fractures in from forty-eight to seventy-two hours. When the fracture is reduced twelve inches of tilt is enough to maintain the position. As soon as the frame is applied a radiograph should be taken to see if the amount of abduction is sufficient and to make what correction may be necessary. Care should be taken to observe that there is no inward rotation of the lower fragment. It should also be seen that there is no adduction of the upper fragment as this may take place if the extension is too great. Only a slight elevation of the patient's head should be allowed at any time, and he should be instructed to help himself and the surgical staff.



FIG. 3.—Showing the straight Thomas splint, leg extension and foot suspension.

In both of these types of cases, namely, those treated on the Jones frame and the Sinclair net bed, when the amount of union is of a fair degree, which usually takes place in from four to six weeks, the patients should be transferred to a Thomas bed splint with a knee flexion bar and the adduction gradually lessened. Active massage and electrical

treatment should then be begun. Great care should be taken that the callus does not give way. In the very young child the plaster should be cut along the sides and the departmental treatment started.

This type of fracture in the old person is best treated on the Jones frame. Massage and electrical



FIG. 4.—Illustrating the essential parts of the Sinclair foot piece.

treatment should be started at as early a date as possible, also, and the ambulatory treatment as soon as permissible.

FRACTURES OF THE MIDDLE THIRD OF THE FEMUR.

This fracture in the very young child should also be treated by a plaster spica but as before only after it has been perfectly reduced. All patients who are old enough should be treated in a Thomas bed splint. This should be a surgical axiom. Why try to improve on the best splint that there is when it can't be done.

The Thomas bed splint.—I wish to emphasize the three most important features of this most efficient splint. The angle between the inside bar and the ring should not be greater than 120° . Where the ring is to impinge on the tuber ischium it should be slightly flattened. The ring should be well but not too thickly padded and covered with leather.



FIG. 5.—Showing the Sinclair foot piece applied.

the second will keep up the pull and nothing will be lost.

Preparation of the patient.—There is an extension put on the leg from the knee to the ankle, clearing the malleoli. I will here describe the method of extension that I prefer, which is that used by Major

Sinclair of the Royal Army Medical Corps, namely, the gauze and glue extension.

Composition of the glue.—Best glue, fifty parts; water, fifty parts; glycerine, glucose or calcium chloride, four to six parts; menthol, one part. Allow it to stand for twelve hours then melt on a water bath. If the preparation is acid to litmus then neutralize with sodium hydrate.

Application.—Take a six inch gauze roll and cut lengths ten inches longer than the limb, stretch and fold once. Do not shave the leg, but wipe it with ether methylated mixture to remove the grease. Then wash with warm sodium bicarbonate solution, using four drams of sodium bicarbonate to the pint of water, to remove the remainder of the fat from the skin. Apply the glue to the leg from the ankle to the knee in an upward direction (Fig. 3). Then apply the gauze strips, under tension, to the outer and inner sides of the leg. Put a loosely woven bandage over this evenly and carefully. When the bandage is in place the tension may be removed. Now the foot is made ready to receive the Sinclair foot piece. The parts of this foot piece are (Fig. 4): A wooden foot piece twelve inches by four inches notched at the sides, and a slot in the centre with an adjustable metallic bar; one inch metal triangles; flannel strips to fit the triangles. At one corner of each triangle is tied a piece of tape and two of these triangles are threaded on a flannel strip.



FIG. 6.—Showing the Sinclair foot piece applied.

Application of the Sinclair foot piece.—The foot



FIG. 7.—Showing the bent Thomas splint and Sinclair foot piece.

is prepared for the glue, which is applied to the entire foot except the toes. Then the flannel strips are brought into position in the following manner: The nurse keeping tension on the tapes, also seeing that one triangle is at each border of the foot, one

strip is placed so that it comes behind the malleoli, one level with the malleoli, and as many more in front as the size of the foot will permit. The strips must not meet on the dorsum of the foot, for if they do they will tend to produce pressure sores. Each strip must be firmly pressed to the foot. When they



FIG. 8.—Showing the straight Thomas splint and the method of overhead suspension.

are all in place then they should be pressed down once more, this time with a wad of cotton. Some of the cotton will remain and this will help the adhesive property of the whole. The wooden foot piece should now be left for a while (Figs. 5 and 6).

Application of the splint.—The Thomas splint, bent exactly at the knee to an angle of 160°, should now be threaded upon the leg. Tension on the leg should be maintained to minimize pain. Care should be taken that the ring is of proper size and impinges strongly against the tuber ischium. The leather on the ring should be well worked down with any good white soap before it is used. The master band should be placed at the site of fracture, starting at the outer bar over the inner bar and clipping at the



FIG. 9.—This shows the application of the knee flexion bar. In this case the extensions have been loosened because it is in the last part of its treatment; the foot is also allowed free movement during exercise.

outer bar. Now the rest of the supporting bands are put in place. These are only one layer from the inner bar to the outer bar. The extension carrier should be fastened to the splint and the extension from the leg tied over this. I prefer to have a

screw arrangement fastened to the end of the splint to take the extension, because in this way the tension can be more easily controlled, and with definite knowledge as to the amount.

The flannel bands are now adjusted so that the proper position of the limb is obtained, remembering the normal anterior and lateral bowing of the femur. There should be no space whatsoever between the flannel strips as the limb will become edematous and sore if this happens. That is the reason we support it in this manner, to get an even pressure. The wooden foot piece is next applied, after it has been covered with a layer of cotton, and the flannel bandage tacked down, the notches pointing upwards. It is placed against the sole of the foot and the tapes tied over it (Fig. 7).

The transverse bar should rest on the side bars of the splint so that there is a little external rotation, and when tension is applied the foot is brought into the dorsoflexed position with the malleoli just beneath the bars of the splint. Tension should not be put on the foot piece for

at least twenty-four hours, if possible, so as to give it sufficient time to set thoroughly. When it is ready, the tapes from the crossbar should be tied over the end of the splint with just enough tension to balance that from the leg. The splint should be slung from overhead with pulley arrangement, as shown in Fig. 7, with just enough weight to allow the limb to be moved easily. This will take up any jar and allow the patient to move without disturbing the fracture and especially the upper fragment. The amount of weight necessary for the sling varies and will have to be estimated for each individual case. At the ring end of the splint the weight on the inner side should be a little heavier than that on the outer. During the acute stage there should be a horizontal pull and this is obtained by raising the foot of the bed ten inches and tying the end of the splint to the vertical bar. This also increases the amount of tension put upon the limb (Fig. 8).



FIG. 10.—To illustrate a proper walking caliper. In this leg has been abducted in order to show the inner part of the splint.

As soon as the union warrants it, ascertained by clinical and radiographic examinations, the bent Thomas splint should be changed for a straight one. This should take place from the fourth to the sixth week. Massage and graduated contraction should be started along with passive movement. When the movement at the knee is of an appreciable degree, a knee flexion bar should be attached. This is a counterpart of the lower end of the Thomas splint screwed on to the bars of the splint and hinged at

a level with the knee joint. The extensions and the lower supporting bands should be transferred to the flexion bar, then with a cord from the end of it through a pulley overhead the patient can exercise his own knee. This is limited as thought advisable by the surgeon, by tying a piece of tape from the end of the splint to the bar (Fig. 9).

From about the sixth to the eighth week the patient should be up in a walking caliper, which should have a ring that fits well but does not constrict the thigh. Also, in order to get the ends of the caliper into the sockets in the heel, considerable tension must be used. The socket in the heel should be bored on a slight slant so as to point the toe a little bit out. The bars of the caliper should be adjustable for length (Fig. 10).

The patient should have daily treatment for the limb and encouraged to sit on the edge of the bed and exercise the knee. The caliper should be worn until the callus is absolutely sound.

FRACTURES OF THE LOWER THIRD OF THE FEMUR.

These fractures are often very difficult to treat so as to produce satisfactory end results. In the very young child they will have to be treated in plaster after having been properly reduced, as in fractures of the other parts of the femur. The knee will have to be more or less flexed according to the individual case.

In older children and in adults the treatment is the bent Thomas splint (Fig. 11). The splint will have to be bent as required for each case, the extension from the leg and foot, and the splint slung from overhead. One should not be satisfied till the fracture is completely reduced. The backward tilting of the lower fragment will be marked in most cases, thus necessitating considerable bending of the splint. Care should be taken in these fractures to protect the popliteal space from undue pressure. This can be done with two strips of good felt, with a space between them, in the axis of the limb placed between it and the flannel slings.

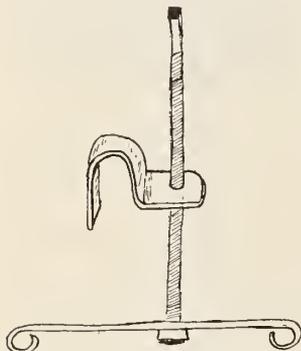


FIG. 11.—Showing the extension carrier. I prefer one where the key is detached and left in the nurses charge. While being reduced, the extension should be increased a small fraction at a time and often.

EXTENSION DIRECTLY FROM THE FEMUR.

Only in a few cases is this method of extension justifiable and indicated. When there are wounds in the parts from which surface extension is taken and when the overriding is marked and cannot be reduced by the ordinary means of extension, which is very seldom, radical extension should be used, and in no

other cases. Even then, I believe, there is only one form of direct extension permissible and that is by means of the Pearson caliper, which is a modified ice tong. One has only to see a number of cases where other means of direct extension have been used to understand and appreciate this (Fig. 12).

Application—The patient is put up in the straight Thomas splint and the knee flexion bar with some extension from the leg or foot to the bar. The knee is prepared for operation and the caliper is applied in the following manner:

An incision one inch long is made over the adductor tubercle and another in a corresponding position on the outer side of the knee. The inner point of the caliper is placed just above and in back of the adductor tubercle. This is tapped home with one light tap of the mallet. Then the outer point of the caliper is placed on a corresponding point of the outer side of the bone and this is tapped home. Great care should be taken that when the points are once placed in position that they do not move. When in position the little screw on the caliper should be fixed so that there is an eighth of an inch gap. Extension from the eyes of the caliper to a screw at the end of the splint and then tightened. Once each day for the first three days the screw on the caliper should be revolved so that one can just see a space between it and the eye of the caliper. As soon as the union is appreciable this form of extension should be changed for one of indirect extension if possible.

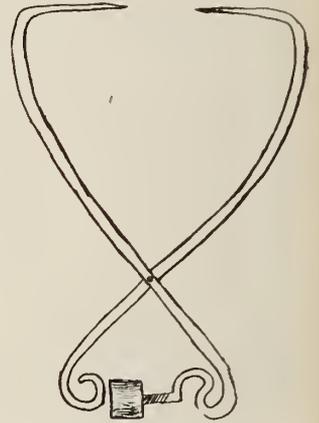


FIG. 12.—Showing the Pearson caliper.

CONCLUSIONS.

I feel that too much cannot be said in regard to fractures. It means much to the surgeon but more to a nation whether from a social, economic, or military point of view. In reviewing the medicolegal end of this question, it is astounding to find the number of awards and the aggregate amount in this country, for fractured femurs. We should never forget that the one idea is the restoration of function. In many places the treatment of these cases falls to the lot of the younger and uninitiated surgeons. The surgeon possibly reaches the stage where he thinks that they are not of sufficient interest and is led to follow, to his mind, the more spectacular branches of surgery. In the thirty-two months I was with the British Army I saw many a man who had had a fractured femur go back to the front line trenches.

I wish to close expressing my sincerest thanks and deepest appreciation for the assistance rendered me in developing these conclusions by my associates at the Military Orthopaedic Hospital, Shepherd's Bush, London, and the Special Military Surgical Hospital, Northfield, Birmingham, England.

221 EAST FIFTY-SEVENTH STREET.

Radium in Surgery*

By W. S. SCHLEY, M. D.,

New York.

We are all familiar with the isolation of radium in 1898 by Mme. Curie, of Paris, following the discovery of radioactive substances in uranium ores after the extraction of uranium, itself radioactive. Its first tentative use, therapeutically, was made in dermatology shortly after its discovery and after observation of the phenomena produced upon the skin in those handling radium salts. In this country the surgeons lay claim to priority and it was my fortune, in association with Dr. Robert Abbe seventeen years ago, to be instrumental in securing some of the original Curie radium, the first that I have knowledge of that came to America. This gave some excellent and quite remarkable results, notably in epitheliomata, warts, moles, nevi, hemangiomata and giant celled sarcoma. In several cases of the latter condition the patients were saved the removal of the whole upper or half the lower jaw where those bones were centrally and extensively involved and these patients are alive and well today. During the last sixteen years I have had the opportunity of using radium and seeing it used in several thousand cases and in following up these cases and studying the results.

USE OF RADIUM.

Radium is applicable in surgery where it can be used as an adjuvant measure to the surgical procedure or where it can better accomplish the desired result of cure or amelioration of a surgical condition as has been said, the superficial epitheliomata are almost always cured, but there are regions where experience has shown surgery is better than radium. I refer to the epitheliomata where periosteum and bone are involved, such as one gets in the deep lesions of the face about the orbit. Radium has an exceedingly good effect in the small or extensive capillary nevus or birthmark up to the large hemangioma present at birth or developing in the early years of life formerly let alone, treated by ignipuncture, or an often bloody excision. Care in the technic of application in extensive superficial conditions will usually result in a surface not only free from scarring but one where normal color and texture have returned.

DERMATOLOGY.

Brilliant results have been secured in the larger hemangiomata, some that had been operated upon repeatedly without success. Keloid, with care in application, yields some remarkable results. The first case in my own experience was that of a colored girl in whom a hard elongated keloid developed on the neck after the removal of tuberculous glands. The keloid was entirely removed leaving a flexible soft skin and linear cicatrix—but white, the pigment having disappeared in the adjacent areas. She seemed rather pleased than otherwise—but it was a lesson in technic. The familiar unsightly hard wart, that acids and hairs from the black cat's tail fail to cure, are regularly removed by one adequate

application, without leaving a trace. Keratoses vanish similarly.

Not to invade too far the domain of the dermatologist, I would cite some of the intractable patches of eczema and psoriasis discovered and treated experimentally in surgical patients. In an observation of two years the areas treated have remained smooth, clean and free from recurrences with normal appearance of skin, while the untreated area remained unchanged.

STOMATOLOGY.

The inoperable carcinomata of the mouth, tongue and pharynx usually show an initial retrogression sometimes very marked in degree, especially in the nonulcerated type with nodular masses, but are little affected after this has ceased and progress unfavorably, although life is usually prolonged, sometimes a year or more beyond expectations and with considerable relief from pain. Cases have been reported of apparent cure at the end of two years. Experience has been the same with esophageal malignancy. Our experience with the internal malignancies, those of the stomach, liver and intestine, has been discouraging up to the present time, but has shown the same retarding effect. In rectal carcinoma with good technic in the major number of cases we attain considerable delay in progress and often relief from pain. The same may be said in general of carcinoma of the bladder and prostate with a few brilliant exceptions of apparent cure. These cases can be punished severely by improper treatment and a severe reaction be many weeks or months in subsiding and accomplish less than more conservative treatment.

UROLOGY.

I have at present a case of carcinoma of the urethra and contiguous part of the bladder. The patient presented herself at the hospital over a year ago and she is being regularly treated. The bleeding has stopped, the tumefaction is half its former size, and the glands in both groins, which were nearly the size of a walnut, are now barely palpable. The patient is comfortable, her health at present seems entirely unimpaired, and she does her housework daily.

We have all seen inoperable cancer of the uterus wonderfully benefitted at times if not cured and with corresponding improvement in general condition of patient. I have never as yet seen carcinoma of the vagina improved. Many fibroid uteri that refuse operative relief or prefer a simpler treatment react astonishingly.

THE SPLEEN.

One of the most interesting phases of radium treatment is that in the surgery of the spleen. I have a patient at present whose spleen has been pronounced of the Gaucher type. It was truly enormous, reaching to within two fingers of the pubes and crossing the midline. The patient's hemoglobin was thirty-nine and her condition was poor. After four treatments her spleen has receded to four

*Read as part of a symposium on radium before the Medical Society of the Greater City of New York, December 20, 1920.

fingers below the free border of the ribs and hemoglobin gone up to seventy-six per cent. in three months without transfusion or tonic treatment. In the same period her weight went from 132 to 155 pounds. She is working hard daily and has not felt so well in several years. Relapse with enlargement of the spleen may occur but she will be in vastly better condition for surgical intervention than originally, even had she had blood transfusion. Another spleen with liver enlargement diagnosed as Banti's disease has receded considerably together with the liver and with improvement in the blood picture, but the case was so far advanced that much could not be expected.¹

ENLARGED THYMUS.

The enlarged thymus gland in infancy and childhood has been successfully treated and radium exposures given even as an emergency treatment in very large thymus with acute symptoms of suffocation, have been entirely successful. Radiographs have shown disappearance of tumor in these cases. Furthermore, relief is often noticeable in twenty-four to forty-eight hours.

Lymphosarcoma of the glandular system and mediastinum, formerly beyond the reach of surgery and medicine, are in a number of instances showing two to four year cures and still going.

We have thus in radium a distinct adjunct to the surgery of malignancy as well as to the surgery of benignity. Patients suffering from inoperable conditions of the breast and those refusing operation for these conditions are often relieved for long periods of time and the disease apparently arrested. They vary from the rapidly growing cellular type to the atrophic scirrhous and results vary accordingly. But here again the technic of radiation has much to do with success. As a palliative in healing ulcerated sloughing surfaces and checking hemorrhage the treatment produces most favorable systemic effects. A hard, completely infiltrated breast, plastered to the chest wall, ulcerated and bleeding, will heal, largely melt away, and the axillary involvement soften up. An effect that surgery alone is unable to produce.

DOSE.

Correct dosage is the one fundamental principle of all radium therapy and can only be learned by long experience. Much harm has been done and not a little discredit brought upon radium application by overdosage or improper dosage. Undertreatment may be as productive of harm as overtreatment in certain circumstances. Radium has also been used in cases that should have gone to the surgeon and in cases over the borderline the patients are being operated upon who should have been treated with radium—at least before operation as some growths become operable thereafter. At times the use of radium in clearly operable cases before operation seems to have been of decided benefit.

POSTOPERATIVE USE.

There is no doubt of its postoperative value in malignancies. Thoroughly efficient preoperative

exposure over the many lines of lymphatic extension and both within and without the operative field of reach I believe essential if we are to increase the number of surgical cures. When one considers that in the breast alone in fully thirty-three per cent. of the cases showing a microscopically negative axilla the patients die of metastases, it can be readily seen that some method of attack must be used that will reach beyond the scalpel. Years ago Halstead showed that supraclavicular glands were found infected with a free axilla. The cells of the primary growth are more resistant than the proliferating cells in the lymphatics which are more readily hedged about by fibrosis. Treatment of the outlying areas by thorough dosage is wiser than treatment of the primary source before operation. It should be continued after operation. It takes a considerable exposure to kill cancer cells even in the more superficial lymphatic glands.

Clinicians have persisted in the use of radium after many early and present disappointments: First, because the effects as witnessed in many morbid conditions have been so satisfactory and permanent that one is impelled to a belief that the technic is primarily at fault in our failures where the anatomical conditions are not insurmountable; second, the early and marked retrogression in so many malignant tumors, followed later by a recrudescence which is often less amenable to treatment, awakens interest in the scientific mind and the desire to ascertain the reason.

CONSIDERATIONS.

In the use of radium as a therapeutic agent the first factors that have to be considered are: The different reactions established in different tissues, different skin quality and texture for both superficial and deep application, length of exposure, quantity of radium salt or emanation and kind and quantity of filtration or screening, character of growth and location, form of treatment surface or implantation and from what direction; also massive doses or small and oft repeated doses.

While radium at present is at its greatest usefulness in the epiblastic surface tumors and formations, its application is being increasingly extended and is in its infancy of development and not in its old age. I wish that it were possible to show many of the results achieved, not only where surgery had failed but where surgery had been outdone conservatively and cosmetically. I believe that the man doing surgery, the clinician, will be better able in the end to administer radium treatment from general anatomical and surgical knowledge of the particular condition than the purely laboratory worker and radiologist unless we can establish a closer relation than in the past has existed generally between the pathologist and the clinician.

Very much has been left unsaid in regard to actual methods of application, many interesting cases unreported and conditions not mentioned, because I have felt that what one most wished to know was the present status of radium in its application in the field of surgery and where it has established a very definite place.

24 WEST FORTY-FIFTH STREET.

¹At the present time, several months after this article was written, the patient is showing continued and marked improvement. The spleen is receding, the hemoglobin is rising, and the liver has markedly diminished.

The Etiology and Treatment of Hand Infections*

By C. D. HILL, M. D.,
Jersey City, N. J.

Some time ago, while examining a patient, I noticed that his right hand had a glistening appearance, the fingers being stiff and drawn up like claws, all the joints ankylosed, and the hand cold and numb. I asked him what had happened to his hand. He said that the trouble had started about five years ago from a small wound of the little finger which became infected. As he described his pain and suffering, the treatment and the final result, with tears in his eyes, cursing everybody who had had anything to do with the treatment of his hand, I decided to investigate why the results obtained in treating wounds of the hand were so often poor. A perusal of the reports of the compensation court on Jersey Avenue showed me how many of the permanent disabilities resulted from hand infections.

Mock, quoted by Kanavel, gives the following statistics, taken from the claim departments of five large insurance companies: Fifteen per cent. of total disabilities are due to hand injuries, and in twenty per cent. of the hand injuries the disability was due to infections; seven to nine per cent. of the total disability from all accidents is due to hand infections. A statistician once followed a man in his ordinary employment for ten hours and counted everything he touched (of course these objects were not aseptic) from door knobs to toilet seats, and found that he touched such places 1,923 times. In other words, with a pin prick on his hand he had 1,923 chances, in the ten hours, of infecting his hand.

It is only when we see a crippled hand that we realize what a wonderful piece of mechanism the healthy, whole, human hand is. You may marvel at some of the wonderful machines you see in factories, yet none of them can compare with it.

When one considers the loss of time resulting from improperly treated hand infections and the great pain and suffering entailed, the importance of adequate treatment in this case is impressed upon us. A patient with an infected hand coming to the wards of a hospital will usually be turned over to an overworked intern, and if such a patient should come to the physician's office, little time and thought will be spent in locating the seat of the trouble and treating it so that there will be the least possible amount of suffering on the part of the patient, the shortest time lost from disability, and the best functional result obtained.

Kanavel in his book on *Infections of the Hand* has worked out the anatomy of the hand in all its details and shows the importance of knowing this anatomy thoroughly, so as to be able to treat injuries and infections of the hand properly. To know the relations and boundaries of certain well described spaces in the hand and to know how and why infections spread to these spaces, is of as much importance as to know when and where to open

the abdomen for an abdominal operation. It is not only necessary to treat these cases promptly and properly but to follow the patients up until they are entirely well, and the function of the hand made as nearly normal as possible.

Without reference to their frequency or gravity we may mention the following infections: felons, paronychia, superficial or subepithelial abscesses, abscess in superficial connective tissue spaces, or cellulitis, lymphangitis, tenosynovitis, infections of the middle palmar space, of the thenar and hypothenar spaces. Each one of these conditions should be diagnosed and given the best treatment for that particular condition. Take as illustrations spreading tenosynovitis and lymphangitis. In the first case proper incisions and aftertreatment will prevent further spread of the infection and one or more incisions should be made at the seat of the greatest pain, not necessarily at the point of the greatest swelling, being careful not to cut the tendons, but to open and drain the tendon sheaths.

In the case of lymphangitis, which often follows a pin prick or other minor injury of the fingers, in two or three days quickly spreading to the whole arm, indicated by swelling and the inflamed lymphatics, we often see fever and great prostration. Too early incisions in such cases will do more harm than good for we rarely find pus at the site of the original injury.

In considering the etiology of hand infections the worst cases are generally found to be due to minor accidents, such as pin pricks, splinters, and small cuts, injuries which were not severe enough, in the opinion of the injured man, to make a doctor's services necessary. The patient himself probably put the injured finger in his mouth or put some dirty material on it, and each of us can recall some filthy poultice that has made for itself a wonderful reputation. You will find that when the injury is severe enough to require a surgeon's attention at once, there is seldom an infection, and if properly treated many of the bad results encountered will be prevented.

For the last ten years the large progressive industries have had these facts so thoroughly impressed upon them that they have installed the necessary equipment for treating their injured employees. The largest part of their work consists of treating minor accidents immediately after they have occurred. So it is a long step from the "company doctor" of ten years ago to the industrial surgeon of today.

The prevention of infection is such a simple matter—the immediate use of iodine—that I tell all my patients to keep a bottle of iodine solution where they work and where they live. This is nothing new, but I wish to impress upon you the importance and ease of preventing infection and when infection does occur, the importance of doing something.

*Read before the Physicians' and Surgeons' Club, February 18, 1921.

When the hand becomes infected, first put the parts at rest by insisting that the patient stop using his hand. In my experience hot water immersions and hot wet dressings are of the greatest aid in carrying out the treatment of hand infections. Usually at night I take the hand out of the hot baths and put on hot wet dressings. I have used boric acid, bichloride of mercury, Carrel-Dakin solution, Wright's solution, and salt solution. Without going into the chemistry, physiology or bacteriology of these solutions I think it is the heat and moisture that do the work.

Sometimes valuable time is lost by trying to treat these cases at the office or at the patient's home. The patient will suffer less, get well quicker, and get better functional results in most cases, by going to a hospital, where under an anesthetic the proper incision can be made and the proper after-treatment carried out. In my experience patients will not carry out the proper treatment at their homes.

A word as to drainage.* This is a small detail, but

it is necessary to put in a drain that really drains. The old idea of packing in a piece of dry iodoform gauze is improper, as you will find that in less than twenty-four hours the opening has stopped draining. It is better to moisten the drain with sterilized oil or petrolatum so as to prevent it from drying out and clogging up the free flow from the pus pocket. If there is not too much bleeding after free incisions, use the hot water immersions or hot moist dressings at once. After the infection has subsided do not wait too long before instituting passive motion and massage. Here again dry or moist heat is often of great benefit.

To sum up the treatment of an infected hand, put the part at rest, make at once the proper incisions to give thorough drainage, and keep up the treatment until the hand is well. If these fundamentals are carried out, you will not have to listen to such agonizing tales as that described in the prelude to this paper.

299 YORK STREET.

Important Points in Bone Surgery

By JOSEPH W. WALSH, M. D.,
Brooklyn, N. Y.,

Associate Surgeon, St. Catherine's Hospital.

No branch of surgery is more difficult to perform than that of the bones and joints. To go through and operate on the bony framework of the body or on a joint is a serious undertaking and strict asepsis must be practised. Special technic, careful precaution in preparing the field of operation, the surgeon assistant, and nurses all constitute a serious responsibility for the operator.

X ray surgical diagnosis in structural bone diseases is an important aid to the surgeon, as his guide before operation and in his observation of the curative progress of repair after operation. The x ray enables surgeons to see that end results of the closed method of treating fractures are often not all that could be desired; overlapping and shortening in the long bones often exist, poor alignment and angulation near point of union occur, with consequent weakness and awkwardness in walking, resulting too frequently in fractures of bones of the lower extremities. Such results should not be found in any but fractures attended with great loss of bone tissue.

In the old treatment by the closed method a deficiency of lime salts or the blood stream carrying a specific germ or shreds of muscle or fascia caught between the ends of fragments will result in non-union of bone. It is advisable to make a blood examination in every fracture case and start systemic blood treatment, if indicated, coincidentally with the treatment of the fracture. The time to settle the question of operating is as soon as possible after the injury causing the fracture. An x ray examination and a consultation with a competent surgeon will settle the question. The x ray should be used in

every fracture case before and during treatment, and only then can the best possible results be expected.

Fracture cases are best treated in hospitals where careful daily observations can be made, noting the condition of the circulation, nerve supply, pain, swelling, and color of the injured extremity. A daily examination during the first two weeks of treatment is very important, especially if the non-operative treatment is used.

VARIETIES OF FRACTURE.

The varieties of fracture are approximately nine: 1, Incomplete, when the bone is bent but not entirely broken through; 2, complete, when the break involves the entire thickness of the bone; 3, simple, a fracture not accompanied by an open wound leading down to the break; 4, compound, a fracture accompanied by an open wound leading down to the break; 5, single, a fracture having but one line (of fracture) making in the long bones two fragments; 6, multiple, two or more fractures the lines of breakage not communicating if these fractures are of the same bone; 7, comminuted, when the bone is broken into more than two pieces, the lines of fracture communicating; 8, impacted, when one fragment is driven into another and fixed in that position; 9, complicated, a fracture accompanied by an injury to other important tissues near the region of the fracture, such as joints, bloodvessels, nerves and muscles.

Fractures about joints are either intracapsular within the capsular ligament or extracapsular without the capsular ligament. Another form of fracture is the sprain fracture in which we find the tearing away of scales of bone to which ligaments are attached.

TREATMENT.

The treatment of a simple fracture is, first, reduce the fracture to the position the bone occupied before injury; second, prevent return of displacement by splints or casts; third, immediate general or constitutional treatment if indicated.

The treatment of a compound fracture depends largely upon the degree of bone destruction and also the extent of injury to the adjacent soft tissues, more especially the main blood and nerve supply, likewise the implication of a large joint, the age and general condition of the patient, specific disease, and visceral disease, particularly of the organs of elimination. If an extremity is involved, the surgeon must consider the service the limb will offer the patient if preserved.

If determined to save the extremity, the first and most important point is to render the wound aseptic and the greatest effort must be bestowed by the surgeon to bring this about. If locally septic, active antiseptic treatment with Carrel-Dakin solution (freshly prepared every twenty-four hours), bichloride of mercury one in one thousand, or a supersalt solution, three and a half to five per cent., irrigations daily. All destructive fragments of bone or any foreign material should be picked out with a forceps, all bleeding vessels secured, and a good sized drainage tube should be inserted in the most dependent part of the wound. When thoroughly aseptic the fragments should be brought together in position of best apposition and wired, or preferably sutured with chromic gut or kangaroo tendon, carefully dressed and placed in special splint or cast in such manner that the wound can be redressed without removing the limb from its position of fixation.

The complications of compound fractures, the more common of which are edema, sloughing, gangrene and muscular spasm, must all rely for treatment on the knowledge and practice of the experienced surgical mind. The special complications of compound fractures such as osteomyelitis, pyemia, spreading gangrene, and surgical fever, should seldom if ever be seen when serious consideration for principles of asepsis is maintained.

Defective union, such as delayed or slow union, imperfect union or nonunion, results from a number of conditions. The causes of delayed union are constitutional, syphilitic, tuberculous, or possibly nutritive. In the latter case the urine of the patient is found alkaline and a copious precipitate of phosphates is found on boiling the urine. This is often due to enforced rest and nonassimilation of food. Regulate such a patient's diet and give mineral acids internally and a speedy union will result. Antisyphilitic and antituberculous treatment should be administered when indicated.

Imperfect union is at times unavoidable, for instance, when callus is thrown out between fragments and is converted into fibrous matter rather than bone tissue. The commonest cause of imperfect union is too wide a separation of the fragments as in fractures of the patella and olecranon. Such fractures are best treated by the open operative method. Defective blood supply found so often in fractures of the neck of the femur is another cause of imperfect union. An entire absence of union is a surgical

rarity. A pseudoarthrosis (false joint) at times results, but seldom a nonunion. The operative treatment of fractures, tends to lessen complications, especially in such fractures as those of the patella or olecranon, where wide separation of fragments is often unavoidable.

Imperative operative treatment is indicated in inflammatory bone diseases that do not respond to proper local measures. The more serious of these resultant conditions are an osteitis resulting in an osteoplastic, septic or necrotic condition or an osteomyelitis that assumes a septic form. This latter condition calls for immediate energetic treatment, exposing the medullary canal, which must be cleared of its inflamed marrow, all septic medullary tissue carefully curetted, and a systematic flushing with bichloride of mercury one in one thousand, or a three per cent. salt solution, every day followed by drainage. Immediate active treatment of this kind will often save a limb.

Specific bone disease calls primarily for specific treatment. Tuberculous bone disease should be treated by rest, constitutional treatment, diet and hygiene. For productive tuberculous bone disease that reaches the stage of infection, immediate operation is indicated. Secondary syphilitic bone disease calls for the iodides in increasing doses; the earliest sign in this condition is always a periostitis. Tertiary syphilitic disease of bone shows itself in the deeper layers of the periosteum or as an overgrowth and infiltration of the bony connective tissue going on to the stage of a sclerosis. Iodides also help these cases but syphilitic necrosis calls for removal of the dead tissues.

Bone tumors are chiefly: exostoses, chondromata, fibromata, sarcomata, carcinomata and cystic tumors. Exostoses or bone growths are best left alone unless they cause unusual inconvenience. Chondroma, which is a tumor composed of hyaline cartilage, is advisedly removed when single, as it may grow to a large size and cause great deformity, especially when occurring in the hand. Sarcoma is the most important primary tumor of bone tissue; it is malignant and immediately upon true diagnosis should be removed. Carcinoma of bone is always secondary and as such is by no means uncommon. The only treatment for this condition is an early radical operation and also the removal of the original source of the carcinomatous growth.

The use of radium in malignant bone conditions has been advised, by using a considerable amount of radium in lead tubes one tenth to two mm. in thickness, in much the same way that MacDonald used it for deep growths (1). He used 250 mg. of bromide of radium in platinum tubes two and a half mm. thick, keeping the tube in the tumor and leaving it in place for forty-eight hours. A long application like this is not advised more frequently than every six weeks. The use of radium in any case should be the result of experience in its application and after careful study of this element.

I have seen satisfactory results from the application of radium by Dr. J. C. Kennedy, at St. Catherine's Hospital, Brooklyn. Radium certainly cures many surface carcinomata and sarcomata, keloids, angiomas, and certain skin conditions such as

moles, pigmented moles, and warts. Yet the chief use of radium today is for inoperable cancer and superficial lesions. Cystic bone tumors are rare, when extensive and the bone is involved to a very great extent, amputation may be necessary.

One object of this article is to induce a greater appreciation of the value of the x ray and its more frequent use in the treatment of fractures in their early stages, the stage of absorption before the formation of plastic lymph, when so many poorly reduced fractures can be brought to a position of

proper reduction and apposition. Another point is the importance of a complete blood examination in all fracture cases; in fact, a blood examination should be made in every serious surgical condition. Another question offered in this writing refers to the more frequent use of the open method of treating fractures and the probable advisability of such treatment.

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698 ST. MARKS AVENUE.

Thoracic Tumor Mistaken for Aneurysm*

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I wish to present an interesting case of a tumor of the anterior left chest, resembling in its appearance, shape and location an aortic aneurysm. The patient had been seen by several physicians, and had also been treated for several weeks by a chiropractor. A diagnosis of aneurysm, I believe, was made by one or more of the medical attendants, according to the statement of the patient. She was told that there was danger of a rupture of the enlarged vessel, with fatal hemorrhage, and that she must not hurry for a trolley or overexert herself in any way on account of this danger.

The patient was Mrs. E. B., white, seventy-three years of age, and was first seen by me on September 29, 1920. She had had eight children, five living and well; three died in early childhood. She had had no miscarriages.

About five months ago she began to have severe pains in the left shoulder, and, somewhat later, severe squeezing girdle pains around the base of the chest, the back and abdomen, radiating from the region of the thoracic and upper lumbar spine. The patient stated that her ailment dated back about five months; that several months ago she noticed a small lump on the left anterior chest, near the left border of the sternum (manubriith). This lump had suddenly begun to grow rapidly during the past seven or eight weeks. The mass itself was not painful or tender, and did not inconvenience her in any way. The chief complaint was sharp neuralgic pains in the left shoulder region and around the back and abdomen. She complained of pain along the thoracic and upper lumbar vertebræ. She had no headache, no attacks of dizziness, no flushing or congestion of the face, no unilateral sweating, no cough; was unable to sleep on account of the pains mentioned above, and during the past few weeks had declined appreciably in health, with some loss of weight. The previous history was apparently negative, except for constipation and an accident to her chest and leg several years ago, which resulted in a fractured ankle. Her husband died of carcinoma of the stomach.

Examination showed a tumor the size of an orange

situated on the upper left chest wall, which at first sight resembled a sacculated thoracic aneurysm. It may be described as fairly round or globular, somewhat hard and fixed. An appreciable irregular outline was distinguished by palpation around this definite circular mass, which made one suspect a neoplasm. The patient presented no symptoms or signs characteristic of the typical thoracic aneurysms that occur in this region or in the same region on the opposite side of the sternum. There was no expansile pulsation palpable, no systolic thrill; there was no diastolic shock, apparently no inequality of the pupils except that at times I thought that the left pupil was slightly more dilated than the right. Oliver's sign, and Cardarelli's sign, were both absent. I could not make out any distinct ringing or sharply accentuated second aortic sound so often encountered in cases of aneurysm. As stated, no tracheal tugging could be made out. There were no palsies of the recurrent laryngeals and pneumogastric. Apparently no derangement of the sympathetic nerve and the typical characteristic pain of growing aneurysmal tumors was absent. The radials were equal in time and volume; there was no retardation of the pulse. There had been no bloodstained sputum, no marked dyspnea, and no dysphagia. Her pain appeared to be a symptom of pressure neuritis, and was of a neuralgic character. The pain had been an early and important symptom in this case. This also holds of thoracic aneurysm. The pain in aneurysm may be intrinsic, i. e., due to irritation of the sac, or internal pressure. More commonly, however, it is extrinsic, i. e., due to irritation of nerve trunks implicated in the advancing capsule or subjected to pressure by the aneurysmal sac.

An aneurysm springing from the concavity of the ascending portion of the aorta, may extend beyond the left sternal border. Aneurysm of the descending arch may rarely protrude at the left sternal border in the first and second intercostal spaces. The most common seat for aortic aneurysm, as is well known, is in the ascending portion of the arch, to the right, and usually appears in the second and third inter-spaces to the right of the sternum, but, as stated, it may occasionally extend in this region where my

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patient presents this neoplastic mass. When an aneurysm occurs in a patient under forty, it is almost certainly due to syphilis; seventy to eighty-five per cent. of all aortic aneurysms are attributed to lues. It is well known, too, that men are very much more frequently affected than women, the proportion



FIG. 1.—Case Mrs. E. B.

being about five to one. The blood Wassermann test in my case was negative. Systolic blood pressure 190-210 (auscultatory over both arms); diastolic 106-100. The uranalysis showed a faint trace of albumin. The phtalein renal function test showed only five per cent. first hour, and fifteen per cent. at the end of six and a half hours; the patient could not void any urine after the first hour specimen until five and a half hours later for the second specimen, as she fell asleep during the interval and was not aroused. A faint murmur was audible over the apex and over the lower end of the sternum. The right scapula stood out more prominently than the left. There were numerous telangiectases over the arms, breasts, abdomen, and left temple. There was an enlarged cervical lymph gland below the left ear which was readily palpable and visible. This was a sign of great significance. Dr. Mulford K. Fisher's fluoroscopic and x ray examination showed that the mass was not intrathoracic and not connected with the aorta.

The pain in aneurysm is constant with paroxysmal exacerbations of great intensity, and is particularly severe at the time of erosion of the vertebra or the chest wall. It is described as sharp, boring, lancinating or cutting in character. It often radiates along the intercostal nerves, and is often intense, suggesting intercostal neuralgia or herpes zoster. The cough in these cases may be due to irritation

of and pressure upon the vagus or recurrent laryngeal nerve, compression of the trachea, or the main bronchus. The bloodstained expectoration is due to interference with the venous circulation or possibly from granulations at a point of impending rupture. The dyspnea is due to irritation of the recurrent laryngeal nerve and is associated with the well known ringing, brassy cough, hoarseness and aphonia—or may be due to compression of the left bronchus or windpipe, or to compression of one or both lungs if the aneurysm is large and particularly if it springs from the lower wall (posterior) of the transverse arch of the aorta.

Osteosarcoma may involve the sternum or the ribs. The overlying veins may become greatly enlarged and tortuous, and the mass increase rapidly in size, but the symptom complex of thoracic aneurysm is absent, as in the case reported herewith. The growth was to the left of the sternal border and not, as is usually the case in aneurysm, on one side. The heart sounds, of course, were not so loud as in aneurysm, and diastolic shock was not felt. Glandular metastasis is present sooner or later in the neck, and this must be emphasized as of diagnostic importance. Solid intrathoracic tumors are often malignant. This is, I believe, a case of sarcoma of the sternum and rib, with metastasis to the glands in the neck, and probably elsewhere, possibly also in the spinal vertebrae, and this meta-



FIG. 2.—Case Mrs. E. B.

static involvement may account for the severe girdle, squeezing, and neuralgic pains around the chest and abdomen. Some of the intercostal neuralgia may be uremic in origin.

Operative interference may be considered. However, in view of the circumstances, I believe radium

and x ray treatment is all that we may safely use in this case. Several other conditions might be considered in the study of this case. However, I have covered the important features of the subject as presented by this patient, and will not wander from the scope of this brief report.

ADDENDUM.

Dr. Henry K. Pancoast, of Philadelphia, from his x ray examination, reports sarcoma of the anterior chest wall, with metastasis to the mediastinum and lungs in the region of the aortic arch and the base of the lung. There does not seem to be any connection between the growth and the bone.

The liver is distinctly enlarged, several fingers' breadth, below the costal margin. There is palpable on deep pressure a somewhat resistant mass in the left upper abdomen, possibly a retroperitoneal

growth. Metastases are also present in the thyroid and axillary lymph glands.

There is only a slight secondary anemia, hemoglobin being about 60 per cent., red blood cells 4,000,000, white blood cells 6,200, blood urea-nitrogen 16 mg. per 100 c. c. of blood; plasma carbon dioxide 59 volumes per cent., plasma chloride 6.1 grams per litre.

A later uranalysis shows many hyaline and epithelial casts, approximately 2,500 or more to the ounce of urine, and about 5 or 6 to the minim of urine; specific gravity 1.027, no sugar, excess of indican, numerous white blood cells. A second phtalein test shows 10 per cent. the first hour and about 12 to 15 per cent. at the end of two hours. At present the patient also shows evidence of acidosis of nephritic origin.

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Psychotherapy*

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The injunction of Pope in his essay on man, "Know then thyself," expresses tersely the general recognition of the importance of one of the chief endeavors of psychotherapy, in its efforts to analyze the qualities of personality. The personality of an individual may be regarded as consisting of qualities which are directly opposed, the one to the other, and just in proportion as one quality evenly opposes or balances the other, so is the normal personal equilibrium maintained or lost.

Déjérine has said that "every emotional reaction is the function of a particular personality." When personality is defined in this way, the comprehensiveness of the term is better appreciated. Anything is an integral part of personality which constitutes an emotion, from the little tickle in the throat which the drunkard experiences as he swallows his liquor, to the thundering applause of an audience to the orator after one of his finest perorations. The explanation of all behavior may be found in the study of the individual in his pursuit of the emotions.

In any analysis of personality, one has to study carefully not only the emotional nature of the individual, but also the impulse or tendency which lies behind the emotion. One may say in general that good impulses create healthy emotional reactions, and vice versa. Hysteria is not a disease which follows as the reaction of success, but may be found quite frequently coming as a result of failure. Our war neuroses illustrate this. Here we have the benefit of a mass experience. Shell shock did not develop in the soldiers who received the severe injuries, the frightful wounds, but occurred rather in those who had never received any serious injury, and in whom objective symptoms

of any kind were absent. In the one instance there was the sustaining emotional reaction, as a result of the consciousness of having done well; in the other, the depressing and demoralizing effect as a natural sequence of failure and fear of disgrace.

In the experience with the mass psychology which we have had in both the war and compensation neuroses, the important rôle of the motive as well as the personality which is responsible for it has been well worked out. Both Kraepelin and Förster have defined this rôle clearly and concisely when they say that the symptoms stand in the service of the motive. The truth of this statement is shown in the rapid disappearance of symptoms in so many cases of the war neuroses after the signing of the armistice, as well as in the recovery in the compensation neuroses in civil life when the dispute over compensation has been settled. The motive in both instances no longer remains, and the symptoms as a natural consequence disappear.

The importance of the personality which is in itself responsible for the motive is well illustrated by the fact that so many of the soldiers in whom the war neuroses developed in France, now since they have returned home, are the ones in whom the compensation neuroses occur. The abnormal personality, which is the important factor, always finds a motive of a morbid character, and the motive requisitions all manner of symptoms into its service.

As Freud has pointed out, there is no relationship between the causes which produce the symptoms and the motive, as, for example, a case of compensation neurosis may manifest either a hysterical paralysis or a conduct disorder. There is, however, a most direct and intimate relationship between the motive and the personality. Is it not rather foolish, then, for us to devote so much time to symptoms

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in such cases which are relatively unimportant, as we have done in the past, and so little to the analysis of personality, the really fundamental factor?

The theory of psychoanalysis of the mental mechanism which is responsible for such cases is that of a psychic conflict between the lower and higher qualities of personality. The potential hysterical is sensitive, proud. His love of applause and the approbation of his environment lead him to exaggeration and deception. He is unable to acknowledge that he is unequal to an occasion. He must devise excuses to explain, defend, and even justify and create sympathy for his course of action. These two conflicting emotions—the desire to seem to be and the fear that the truth will out—create a conflict. The compromise by flight into sickness, von Hattingberg (1) says, saves the hysterical from his dilemma of the conflict. The neuroses are the result of the patient's attempt at the accommodation or adjustment of himself to a situation to which he is not equal.

In the war and compensation neuroses where the experience is a mass one, and the motive, conflict, compromise, etc., have been made perfectly plain, the psychoanalysis is not difficult. In the often complicated cases which we encounter in everyday life, however, the exposure of the motive is not so easy.

The thought naturally occurs here that such a theory makes all hystericals, all cases of war and compensation neuroses, malingerers. At first appearance this would seem to be true; but a closer scrutiny does not justify such a conclusion. The patient is not conscious in the majority of instances of any relationship between his psychic conflicts and his present symptoms. If he were, he would not exhibit his symptoms so obtrusively.

It is not in place here to enter into any extensive discussion as to the meaning of the word unconscious in the sense in which it is applied in these cases. The term is variously interpreted and has been the subject of much controversy. In my opinion, the unconscious is simply a dissociation from the consciousness of unpleasant experiences, the relegating of these experiences to the mental attic, as it were, not only because it is the natural tendency of the patient to repress unpleasant things, but even more for the reason that he is not conscious of their pertinence to his present condition. As soon as the relationship of these incidents have been shown to him in the process of the analysis, they are at once recognized and brought into the active consciousness again. Such experiences were not forgotten or buried deep in the unconscious beyond recovery by any ordinary means of memory association as some psychoanalysts wish us to believe, but merely put away very much like old furniture is stored away because it is unsightly or thought to be needed no more in the living room.

The patient is perfectly aware of his morbid and depressed mental state, and the causes of it, when these have been pointed out to him. But his mind has been so centred on what he has thought to be physical disease that he has either given it no consideration, or, what perhaps is more likely, put the cart before the horse, and made the physical con-

dition responsible for the mental state. The hysterical paralysis in the mind of a patient with war or compensation neurosis is a genuine paralysis due to injuries which the patients believe to be in the one case the result of the concussion of a high explosive shell, or, in the other, to the shock of the accident. There is no consciousness whatever on their part that the foundation for these paralyzes was being laid, back in their youthful days when they quit school, ostensibly to go to work, but in truth because they desired to avoid the painful process of study. Remembrance of these things is not lost. It is only that the dissociation of any connection between such experiences in their lives and their present condition is complete. They are entirely unconscious that the evidences of their disease began to show themselves years ago, that it has to do with an imbalance of personality, which in turn is responsible for the morbid motive and the unhealthy emotions that are the real causes of their paralyzes and other symptoms.

It is not difficult to see that in these patients the ordinary methods of examination are entirely inadequate. The knowledge which is so essential for making the patient known to himself, for bringing about an analysis of his case, requires not only special means in the study of personality, but also ways of revealing the mental content when the stream of thought is not directly under the control of the patient's will.

What has been called the pathopsychograph is intended to meet the need of studying the personality. The scheme of the pathopsychograph, according to Stern (2), is to ascertain what the disposition is, how it was developed, what qualities were inherited, and what have been formed as a result of environment. As this author says, "a pathopsychographic examination has to consider that previous acts in our lives either influence or create the influence or tendency to the things we do later." For this reason, in his psychograph, he has found it insufficient to deal with simply what he calls the *querschnitts* psychograph, a transverse section, as it were, of the patient's life at the present time, but to take up the different epochs of his life and examine each one separately. At the same time emphasis is placed on the conduct of the patient toward other persons and the influence which they in turn have had on him. For this reason, a thorough history of the grandparents and parents, also other relatives, so far as it is possible to obtain it, concerning the social, artistic, religious and moral atmosphere existing in the family, is essential. The physical health is also recognized as an important factor in the study of the psyche. The knowledge of the family and individual traits brought out in this manner furnishes us with the required information concerning the strong and weak qualities in our patient's personality, and thus tells us wherein the imbalance lies.

The value of such indirect methods as the interpretation of dreams and the association test becomes apparent when we recognize the nature of the patient and his ignorance as to the cause of his illness. These methods enable us to scan the thought content of the patient without the danger of being misled by him, either consciously or unconsciously:

Into this thought stream, by such means, the censor, as symbolized in the will power, is not on guard, and thus the true mental state is exposed to the scrutiny of the examiner.

As in the physical methods of examination, so it is in the psychic: one prepares the way for the other. The psychograph, with all the details which it gives of the life of the patient and his environment, furnishes us the key to the interpretation of his dreams. In symbolic dream interpretation, much the same situation exists now as existed in Daniel's time. Daniel tells us in the *Book of Daniel* that Nebuchadnezzar had a dream. In order to have this troublesome dream explained to him, he summoned from all parts of his kingdom the wise men and astrologers. Then Daniel naively adds, like some of the modern interpreters of dreams, that he of all this learned assemblage was the only one who was able to give the correct interpretation.

The justice of the criticism in regard to the difficulty of agreement in the interpretation of dreams between the different psychoanalysts is admitted, the danger of fantastic and devious interpretations cautioned against; at the same time, the importance of much knowledge of the subconscious which is brought out through this means cannot be denied. As proof of this, one illustration will suffice:

In the history of a patient, it was learned, among other things, that her husband drank, that she had been sick since her marriage, that in all her former life she had leaned heavily on her mother to assist her in life's difficulties. Her trouble at this time apparently had nothing to do with these things. Her complaints were largely concerning her stomach. She had been told that she had a stomach ulcer, and for this reason was possessed with a great fear that she might starve to death. One day she related a dream, which had frightened and distressed her, that she had had the night before. In this dream she saw standing in the centre of the room a large wash tub. All coiled up, lying inside this tub, was her only brother, who was a tall, thin man. Around the edges of the tub were piled up a large number of whiskey bottles. Her mother was standing over the tub with her sleeves rolled up. When asked by the patient what she was doing, she replied that she was distilling the whiskey out of the man in the tub.

The brother was not a drinking man. So far as giving any new facts, this dream did not do it. We knew these things before. What it did do, however, was to put a new meaning into these facts. The proud, hypersensitive nature of the patient would not permit her, consciously, to acknowledge even to herself, much less a physician, her bitter disappointment and unhappiness concerning her home conditions, as well as her utter helplessness and failure to manage the situation alone. Her mother was personified in the dream as the outside assistance which she so intensely yearned for. It remained for the dream when the censor was off guard to furnish us with a glimpse into the true mental state of this patient, and it exposed the motive responsible for her condition.

The associations test (3) is another method similar in nature to the dream interpretation. It has for its aim the catching of the patient unawares; as

it were, the unmasking of him. This is accomplished by the aid of certain test words which are pronounced slowly before the patient and to which he is requested to respond immediately with the first word or phrase which the test or stimulation words suggest to him. The interpretation is sought in the test words and their association complexes which have caused evident hesitation and embarrassment to the patient. This method is based on the fact that unpleasant emotional ideas express themselves more intensely than pleasant ones. Also, that we are more sensitive in regard to them, and they are easier to arouse within us.

The task of psychoanalysis is by no means accomplished when the disillusionment has been completed. The revelation to the patient that his symptoms are mental and not physical, that all his life has been made up of petty camouflage in which he has not only deceived himself but his friends as well, is a distinct shock. One patient, after the exposure, exclaimed in absolute despair: "If I am such a weakling, how can I ever get well?" Another said: "How I wish I had something which only an operation was needed to relieve, then all I would have to do afterward would be to lie in bed and just recover."

The technic in the adjustment and reconstruction stages of psychoanalysis is most important. What sterilization and asepsis are to the surgeon in his operation, so is isolation to the psychoanalyst. We may think of the disturbances of personality in terms of the infections. When we symbolize them in this manner, the difficulties of their treatment are better appreciated. There are cases of psychic imbalance which are comparable to such cases as those of arthritis deformans and the inoperable malignancies; for these cases, there is no cure.

On the other hand, we have also, figuratively speaking, our focal and general infections, mild or severe, which vary in degree of severity and treatment, from the simple lancing of an abscess or boil, which may be safely done in the office, to the major operation which requires such care in technic that all the modern equipment of the hospital operating room is needed for its success. Outside infection would be fatal.

So it is in the various nervous conditions. It depends on the nature of the case as to the degree of isolation necessary, as to whether outside contamination is likely to prove fatal or not.

The patient is both humiliated and disappointed with your diagnosis. His friends are perhaps indignant. It is so easy for them to persuade him that you do not understand his case. The wish is father to the thought. He consults some other physician, who discovers a physical condition as responsible for his affliction, which he is advised an operation will cure. In the latter diagnosis he sees himself vindicated. He much prefers, instead of the tedious, unpleasant, and difficult process of character building confronting him, in which personal effort, perseverance and courage are necessary, the operation, where all he is required to do afterward, as my patient expressed it, is just to lie in bed and get well.

The aftercare, what has been called the followup methods in these cases, is also very important. Our patients are convalescing. They are making a good

fight, full of hope and determination, under the stimulating influence of encouragement and a favorable environment.

Before they are strong enough to stand alone, they are compelled to return to their old surroundings, and there, encountering the same conditions which brought about their imbalance in the first place, there is a relapse. As in many other things, so here also we may profit by our war experience. It was found that the patients with war neuroses often served quite efficiently in other occupations behind the lines; but if sent back to the front again, their nervous symptoms returned. If we feel that, after education and readjustment, our patients are still unequal to the conditions confronting them, an endeavor should be made to adjust these. The internist seeks to specify the regimen under which his quiescent tuberculous patient is going to live and work after his return home. The heart specialist prescribes the amount of exercise which he feels his patient with heart disease is equal to without again bringing on decompensation. And so it is just as essential for the neurologist to try and modify the strain and stress which his convalescent nervous patients will be likely to encounter in their home environment to assist them in maintaining their psychic equilibrium. He should seek to have a heart to heart talk with the incompatible husband or the nagging wife or whoever or whatever the disturbing factor may be and adjust or relieve it.

We all realize full well the power of suggestion in psychotherapy and should make intelligent use of it at all times. But suggestion alone, without the education and enlightenment of the patient as to the underlying cause of his nervous condition, is an

attempt to remove the symptoms without doing anything for the disease. To tell a patient that he is physically well, to quit his worries, and go home and brace up, with all the mental disturbances of a broken psychic equilibrium seething within him, is but a careless, palliative procedure.

The two fundamental objectives in psychotherapy are: 1, the education and enlightenment of the patient as to the real cause of his symptoms, and 2, the restoration or adjustment of his psychic equilibrium. These things are not something which may be obtained in a day. They are rather the result of a slow and painstaking process, often requiring months for their successful accomplishment.

The practice of psychotherapy should not be taken up carelessly, in an ignorant and unscientific manner. It has both method and technic, like surgery; and like surgery, it requires knowledge and experience in its successful application. Death often relieves the victim of the surgical bungler; the victim of the bungler in psychotherapy is not so fortunate. He lives on in his miserable existence, his opportunity for a stable readjustment, his chance to live in peace and comfort, to be equal, in a word, to life as it presents itself to him—destroyed. If the psychotherapist desires to reduce his mortality, so to speak, like the surgeon, he can best accomplish it by taking greater pains in the various stages of the technic.

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- 1044 LOWRY BUILDING.

Organic Conditions Associated with the Psychoneuroses

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The United States Public Health Service Hospital No. 37, of Waukesha, Wis., is an institution for borderline mental and nervous cases. At this hospital we not only seek the psychogenic factors, the repressed complexes that according to the theories of Freud are the basis of all the neuroses, but we also examine the patient with extreme care to determine whether or not he is suffering from any organic disease that may be the cause of, or a contributing factor to, his nervousness. In this connection it may be remarked that the services of consultants in internal medicine, surgery, orthopedics, urology, and eye, ear, nose and throat, are freely used and the diagnosis is confirmed by all the latest laboratory tests. It seems reasonable to assume that such a series of searching examinations will reveal even obscure organic conditions, and practice has proved this deduction to be correct.

In an unselected series of 443 cases, 262, or fifty-nine per cent., were diagnosed hysteria, neurasthenia, anxiety neurosis, or psychasthenia. Cases otherwise diagnosed have been excluded from this study of the

organic conditions associated with the neuroses. It is believed that the inclusion of cases with a primary diagnosis of organic disease would increase the percentage of organic findings and thus be misleading, and the same considerations hold true for cases of traumatic neurosis. Cases of constitutional psychopathy and the psychoses have also been excluded, as it was desired to restrict the investigation purely to the psychoneuroses. Of the 262 cases, 152 or fifty-eight per cent. were found to be hysteria, eighty-one or thirty-one per cent. were neurasthenia, sixteen or six per cent. were diagnosed anxiety neurosis, and thirteen or five per cent. were cases of psychasthenia.

Of the 152 cases of hysteria, 119 were diagnosed as such without organic additions, twenty-one or thirteen per cent. were diagnosed as hysteria with organic factors, and twelve cases or eight per cent. were diagnosed as hysteria with coexisting organic conditions. A total, therefore, of thirty-three cases or twenty-one per cent. showed associated organic conditions of sufficient importance to include the

same in the diagnosis. This is a rather high percentage of organic findings in a disease of supposed functional origin and illustrates the value of painstaking investigation.

Pyorrhea occurred in twenty-one cases, and carious teeth in twenty-six cases. These figures illustrate the need for a careful dental examination of hysterics. Many of these individuals have obscure gastrointestinal or other symptoms that can be relieved by proper corrections of dental infection. Hyperopia was found in seventeen cases, and myopia in seven cases. Considering the frequency of headaches in these patients, it is practically needless to remark that the correction of errors of refraction, such as these, is frequently of lasting symptomatic benefit.

Of pulmonary diseases, active tuberculosis was excluded, as whenever this disease was found it was made the primary diagnosis and the neurosis was considered of secondary importance. Five cases of inactive pulmonary tuberculosis were found, four cases of chronic bronchitis, and two cases of chronic fibrinous pleurisy. Of cardiac conditions, two were cases of mitral stenosis, three of mitral insufficiency, and there was one case of myocarditis. Two cases of chronic nephritis were found, one of cystitis, and one of pyuria of undetermined origin.

In this series there were four cases of chronic gonorrhoea, one of acute gonorrhoea, one of primary and one of secondary syphilis. The low incidence of venereal diseases is quite striking and probably is indicative, in some measure, of the imperfect sexual adaptation of these patients. Many are shy and timid in the presence of the other sex, and others seem to be suffering from a relative sexual anaesthesia. Five patients suffered from gastrointestinal complications; two cases were diagnosed as gastrointestinal toxicosis, one chronic gastritis, two were cases of cholecystitis, and there was one case of colitis. Eight patients suffered from flat feet. Proper shoe prescriptions are frequently indicated in this disease. There were four cases of mild hyperthyroid complications and one of polyglandular dysfunction. Also, five cases were complicated by neurocirculatory asthenia, the effort syndrome.

Of the eighty-one cases of neurasthenia, fifty-one were diagnosed as such without organic additions, twenty-three or twenty-eight per cent. as neurasthenia with organic factors, and seven or approximately nine per cent. as neurasthenia with coexisting organic conditions. A total of thirty cases or thirty-seven per cent., therefore, exhibited associated organic conditions of sufficient importance to include the same in the diagnosis. The corresponding figure for hysteria is twenty-one per cent., and this comparison agrees with the theory frequently expressed that neurasthenia is much more apt to have a basis of physical disease than is the case with hysteria.

Among the neurasthenics there were seven cases of pyorrhea, six cases of carious teeth, thirteen cases of hyperopia, and five cases of myopia. These figures show that the need for proper dental and eye examinations is quite as important here as in the hysterical cases.

Three cases of inactive pulmonary tuberculosis and four cases of chronic bronchitis were found. A

total of eight, or approximately ten per cent. of the cases, showed cardiac disease. One was a case of mitral stenosis, four of mitral insufficiency, and two of chronic myocarditis. One case was diagnosed as mild organic heart disease with bradycardia. The figures show that examination of the heart in neurasthenics is no mere routine, and frequently the cardiac disease is the real basis of many important neurasthenic symptoms. There were two cases of chronic nephritis, and one of cystitis. There were three cases of syphilis and one questionable case of gonorrhoea. The rarity of venereal infection is even greater, therefore, in neurasthenia than in hysteria.

The gastrointestinal complications are among the most frequent and important in neurasthenia. In eighteen of our eighty-one cases or twenty-two per cent. there was gastric disease. Of these, nine cases were diagnosed as chronic colitis, one as toxic headaches, two as chronic cholecystitis, and six as gastrointestinal toxicosis. It is hardly necessary to point out that when one complication occurs in eleven per cent. of the cases a search for it should always be instituted. Chronic colitis is probably the most important single complication of neurasthenia.

Two cases of mild hyperthyroidism and one case of dyspituitarism were found. Four cases of neurocirculatory asthenia were noted. There were three cases of flat feet, one case of scoliosis, and one case of chronic backstrain. In view of the very frequent complaint of pain in the back, the absence of organic disease of the spine in neurasthenia is very striking. The only important skin condition was one case of psoriasis.

Of the sixteen cases of anxiety neurosis, three were diagnosed as with organic factors, and three with coexisting organic conditions. Six cases, therefore, or thirty-seven per cent. of the whole, showed organic findings of sufficient importance to include the same in the diagnosis. It is felt that the number of these cases is too small to make the statistics of any particular value, so the various complications will not be given in any detail. Chronic nephritis, of a low grade of virulence, seems to be the most important complication, and it occurred in two cases. One case of inactive tuberculosis, one case of chronic colitis, and one case of chronic gonorrhoea were also found. There were but few cases of any particular disease.

There were thirteen cases of psychasthenia, and none of this total were diagnosed as with organic factors or coexisting organic conditions. A search of the histories of these cases shows no organic conditions of any particular importance. This absence of positive evidence is very striking and strongly suggests that this condition is a pure neurosis without any organic basis worthy of the name.

These statistics do not disprove the theory that the neuroses are chiefly of psychogenic origin. They do show, however, a rather high percentage of associated organic diseases and demonstrate the importance of an extremely careful physical examination of all of these cases. In many of these cases the cure will necessarily be incomplete if the associated disabling physical disease is not recognized and properly treated.

Acute Diffuse Suppurative Labyrinthitis with Report of Cases

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It was reserved for only the last two decades to advance labyrinthine suppuration to the foreground of otological investigation, rendering operative interference in the dangerous middle ear affections a more or less successful procedure. Jansen (1) deserves the credit for having first called our attention to these complications of middle ear suppuration, which are of such importance to the otologist.

Acute suppuration of the labyrinth is not a common occurrence, as far as ear complications go, although it is stated by Politzer (2) that "labyrinthine suppuration must be reckoned to be the most frequent anatomical cause of intracranial complications arising from the temporal bone." According to Bezold, involvement of the labyrinth occurs once in five hundred cases of purulent otitis. Other observers place the figure as low as one in a hundred. We are inclined to believe that one in three hundred would be a more accurate estimate. Its advent upon middle ear suppuration can indeed not be observed too infrequently for the satisfaction of the otologist. The seriousness of the condition with its immediate possibilities, giving rise to the dangerous intracranial sequelæ that may follow, not mentioning the inevitable and irreparable damage done to the auditory and vestibular function, render the condition a most formidable one. Judging from the literature, those cases in which recovery takes place exceed those in which the affection runs a fatal course. As a matter of fact, it is stated that several cases have recovered with a return of the hearing function. Nevertheless, there is a question in our minds whether in a case of well established labyrinthine suppuration the latter is ever possible. We can hardly conceive of any suppuration taking place in so small a cavity, being limited to so minute an area as we are led to suppose.

There are some observers, however, who divide acute labyrinthine suppurations into the so-called circumscribed and diffuse variety, and this classification is found in most modern textbooks. We are inclined to believe that in those cases in which recovery takes place with no impairment of hearing, the process has not gone on to suppuration, and the so-called localized or circumscribed acute suppurations are nothing more than those nonsuppurative changes, which run their course with labyrinthine symptoms and are capable of subsiding, viz., increased labyrinthine pressure due to hyperemia and hemorrhage and the labyrinthitis serosa of Alexander. In this respect we refer particularly to the acute cases. It is conceivable, however (and this is in accord with the clinical and pathological findings demonstrated most conclusively by Manasse,

Habermann, Panse, Lange, and others), that in the chronic form, associated with the presence of a demonstrable fistula, the condition must of necessity be a well circumscribed and localized affection, for we are dealing here with an active functioning labyrinth.

Many patients present themselves with chronic suppurating ears, complaining of impaired hearing, and, after careful questioning, admit of occasional attacks of vertigo. These are nothing more than cases of chronic suppurative otitis media, plus a chronic circumscribed suppurative labyrinthitis. This latter additional diagnosis is of the utmost importance. The pathological process in these cases has involved one or more of the semicircular canals (most often the horizontal), and in consequence these patients have a highly sensitive vestibular apparatus, by reason of the easy access of atmospheric changes to the inner ear as a result of the fistulous communication. The fistula can be demonstrated by the alternate condensation, and rarefaction of the air in the auditory canal. A positive test shown by the employment of the Politzer bag is one in which, upon sudden condensation of the air in the canal, there will be elicited an induced nystagmus in one direction, and, upon sudden rarefaction, a nystagmus in the opposite direction. The nystagmus, it should be remembered, is not typical, not rhythmic, but jerky and irregular. The fistula test is not always positive. Its absence does not preclude a functioning labyrinth. From a fistula test we draw three important conclusions: first, the absolute evidence of a fistula; second, an active functioning labyrinth; third, a localized or circumscribed form of labyrinthitis.

Clinically a case presenting labyrinthine irritation with marked symptomatic reaction can hardly be classified with definite certainty. It is only after careful observation of our case with due consideration to the outcome that we can state with assurance whether our case was one of true suppuration or not. In a given instance, when bone conduction is completely gone after the onset of the labyrinthine affection, we may justly conclude we were dealing with a purulent labyrinthitis. The dead labyrinth after a time is well compensated for, the other labyrinth assuming responsibility for both, so that the process when it has ceased leaves the patient with a well balanced vestibular apparatus. But whether the hearing is present or lost is a different matter. We believe the auditory function may be taken as an accurate index concerning the type of labyrinthitis we are dealing with. If, after a patient has recovered, audition in that ear exists, we can safely state that the patient was suffering from one

of the nonsuppurative varieties. But if, on the other hand, audition is completely gone in the affected ear, we are inclined to feel it was of the suppurative type. We wish it to be borne in mind that we are viewing these cases only from the viewpoint after recovery. If we are fortunate enough, however, to observe these patients during the active stage of labyrinthine irritation, and we are able to follow them through the course of the disease, we would indeed be in a better position to determine the type of affection during the active stage. This stage of irritation is a short one, and only rarely do we see the patients so early. The acute suppurative form runs a rapid course; its onset is usually sudden and the symptoms are violent and most striking, and the patient is apparently very ill within a few hours. The irritative stage is of short duration, and often it is a question of only a few hours before the labyrinth perishes. This is particularly true in children, as we shall point out later, in which instance it is oftentimes entirely overlooked. In the early irritative stage the nystagmus is directed to the affected side and the cochlea still functions, audition being present. As soon, however, as the labyrinth loses its irritability, our nystagmus becomes directed to the well side, and the cochlea ceases to function.

At the best, a diagnosis of acute suppurative labyrinthitis is a difficult one, especially when there are intracranial complications to be considered, and when labyrinthitis coexists, and is responsible for the intracranial lesion. Then, if we recall also that other changes which have the power of subsiding can produce the same symptoms, it becomes a matter of additional difficulty. It requires an assiduous and complete study of our case, a thorough analysis of the symptom complex which the patient presents (and this is not always as typical as we would be led to suppose), a careful investigation into the patient's history before the onset of the condition, with special attention to the hearing power, and the occurrence of attacks of vertigo and disturbance of equilibrium, the performance of an accurate functional examination, and, lastly, a knowledge as to the proper interpretation of the data at hand, all of which will aid materially in arriving at a more accurate conclusion.

It is not our desire to describe nor discuss the etiology and pathology of acute diffuse suppurative labyrinthitis, for we would much rather leave that to the more modern textbooks, most of which offer able and comprehensive descriptions of these phases. But the so-called labyrinthine symptom complex (consisting of vertigo, nystagmus, and disturbed equilibrium) is of the greatest interest to the otologist, and the *modus operandi* of each of these particular sensations we wish to consider more in detail. In order that one may appreciate the phenomena observed in labyrinthine affections relative to both the subjective and objective manifestations, we shall recall a few of the well established anatomical and physiological observations.

The vestibular centre consists of three points of origin from which the vestibular nerve fibres spring. Collectively they are called Dieter's nucleus, and are located in the lateral wall of the fourth ventricle. The terminal nerve endings of the vestibular nerve

are found in the ampullated ends of the semicircular canals. Hence, stimulation of the semicircular canals on one side results in stimulation of the corresponding vestibular centre. The symptom complex results from stimulation, during the active stage of labyrinthine irritation, on the diseased side. As soon as our labyrinth ceases to function, these manifestations result, not from stimulation of the corresponding centre on the diseased side, for the nerve endings in the semicircular canals no longer transmit stimuli to the centre, but result from imbalance of centres, the well centre being now the stimulative one. This is analogous to distortion of the face as observed in a unilateral facial paralysis. In this instance both sides of the face normally are in a state of muscle tonicity, both sides being equal. As soon as one side fails to act, the other overacts, and causes the displacement to the unaffected side. Similarly the vestibular centres are constantly in a state of tonus, and hence, with the failure of one centre to maintain this tonicity by reason of a dead labyrinth, the other necessarily becomes the stronger, which practically amounts to stimulation of the centre on the nonaffected side.

One of the pronounced subjective sensations resulting from labyrinthine irritation is that of vertigo. Vertigo may be defined as that subjective sensation resulting from disturbed function of one of the three tracts having to do with the maintenance of equilibrium. Briefly these tracts may be described as follows: 1, vestibuloocular; 2, vestibulospinal, and, 3, vestibulocentral. The first of these tracts is connected through Dieter's nucleus, and the fasciculus longus with the corpora quadrigemina and the ocular muscles. The second connects with the spinal centres of the cord and gives us our muscle and arthroclial sense necessary for the maintenance of equilibrium. The third connects with the higher centres in the cerebellum. Destruction of any of these three tracts results in vertigo. The remaining two after a time can be sufficiently trained to enable the patient to again maintain equilibrium. Disturbance of the vestibuloocular tract is exemplified in cases of labyrinthitis, of the vestibulospinal, in tabes dorsalis, and the vestibulocentral in cerebellar lesions. The vertigo from which the patient suffers in labyrinthine irritation is characterized by the movement of objects. The objects move in the same direction as the rapid component of our nystagmus, or, in other words, they move opposite to the direction in which the patient falls. The one notable feature of vestibular vertigo, and a point of the greatest value in diagnosis, is the tendency for it to diminish day by day rather than to increase, as is the case in cerebellar disease. The vertigo of vestibular origin, especially when severe, is frequently associated with nausea and vomiting.

Nystagmus is a constant concomitant manifestation of vestibular irritation. It may be defined as an oscillation of the globe of the eye. It may be horizontal, vertical or rotatory (a combination of both). There are three varieties of nystagmus depending upon the underlying cause: 1, ocular nystagmus; 2, vestibular nystagmus, and, 3, central nystagmus. The ocular nystagmus gives us an equal undulatory movement in both directions. It

is frequently physiological, seen in some normal individuals, and is encountered most often in patients with high degrees of myopia and in albinos. It occurs in all positions of the eye, and is not increased in any one position. The rapidity of movement is equal in both directions, so that we have neither quick nor slow component. Vestibular nystagmus is characterized by the fact that we have a rapid movement in one direction and a slow movement in the other. The slow movement is the true nystagmus resulting directly from labyrinthine irritation as will be shown later. The quick component is the cortical correction and is voluntary and results from activity of the higher centres. That this is so is easily demonstrated when we attempt to induce nystagmus by means of a caloric test in a patient under an anesthetic. In this instance, as a result of our anesthesia, the higher centres are not acting, and consequently we get a conjugate deviation of the eyes in the direction of the slow component. Furthermore, the nystagmus is increased when we abduct the eyes in the direction of the rapid component. In order to understand more clearly the sequence of events in the production of nystagmus of vestibular origin, we must refer to Hoegye, who demonstrated that when a vestibular centre on one side was stimulated from the corresponding vestibular apparatus, the abductor of the eye on the same side and the abductor of the eye on the other side contracted, giving a slow movement of the eyes in the opposite direction of the stimulated centre and a rapid cortical correction to the same side. The nystagmus is named according to the rapid component because it is more pronounced and easier to follow. Vestibular nystagmus is characterized by the fact that it tends to diminish day by day. Central nystagmus is the result of lesions in the cerebellum. It is characterized by its tendency to increase day by day. The position of the head does not in any way influence the direction of falling. The patient usually falls to the side of the lesion.

The disturbed equilibrium results from irritation of the vestibular nerve filaments. It is manifested by the patient falling when assuming the erect posture. In disturbed equilibrium due to vestibular irritation, the falling bears a definite relation to the nystagmus. The patient always tends to fall away from the quick component. Furthermore, with changes in position of the head the direction of falling is also influenced. For example, if a patient has a nystagmus to the left, he will fall to the right. Now, if the head is turned to the left, the direction of the quick component of the nystagmus is directed backward and the patient will fall forward. Likewise, if the patient's head is directed to the right, the patient will fall backward, the nystagmus now being directed forward. The disturbed equilibrium of vestibular origin tends to diminish daily, the two remaining tracts being sufficient to maintain equilibrium after a period of training.

Earlier in this paper we stated that the presence or absence of the vestibular and auditory function could be taken as an index as to whether our labyrinthitis was of the suppurative or nonsuppurative type. We find that W. C. Phillips (3) and others

are of this opinion, employing a terminology entirely different from that employed by the Vienna school, the latter classifying the cases according to whether they are of the so-called serous or suppurative type. Phillips, however, would substitute grave for the suppurative form, those cases in which the labyrinth ceases to maintain its irritability; and mild, in which irritability persists.

In regard to the treatment of these cases, we find that great difference of opinion exists. However, the controversy must of necessity be justified, when we recall the fact that the classification of the forms of labyrinthitis are so varied and numerous. A universally accepted plan of treatment does not seem possible, even if we were all to agree upon the same basic division of these cases, for the great field of possibilities, varied courses and supervening complications render each case a subdivision in itself, but we do feel that the classification submitted by John B. Rae (4) is a simpler one, taking in the large majority of cases, and giving us a rational, logical foundation upon which to institute operative interference; and furthermore, a matter of even graver importance, it gives us a comprehensive indication when to keep hands off. According to Rae's classification, we can have only one form of acute suppurative labyrinthitis, and that is, the diffuse variety.

With a properly applied and interpreted functional examination, we can come to a more or less definite conclusion as to whether our static labyrinth is still functioning. Having decided that it is, in the absence of further complications, there is only one form of treatment to follow, and that is the expectant one. We have no right to interfere when the labyrinth is still irritable, and when audition exists. As soon as our labyrinth ceases to function, we are more convinced that our process has gone on to the formation of pus. Even with this diagnosis definite, we still have no indication to interfere as long as there are no evidences of extension to endocranial structures. Pus in this location as in other places can well be taken care of, even if radical measures are not instituted immediately to facilitate drainage. After the acute symptoms have abated, however, something more radical may then be considered. We are reporting two cases, both of which will illustrate very conclusively and satisfactorily the point in question. Of course, if during the active stage definite symptoms develop, which indicate possible extension, then we would not advise procrastination. Meningitis, which is by far the most common complication arising from a suppurative labyrinthitis, must be borne in mind. Any evidence of meningitis calls for immediate intervention. In this regard, we wish to emphasize the great importance of early lumbar puncture and its frequent repetition and the changes in cytology and chemical composition carefully studied. Unfortunately, many cases are complicated and atypical, and just when to interfere is often a question. To wait for a rigid neck and a spinal fluid swarming with microorganisms when a meningitis is well established, before draining the labyrinth does not offer much hope for the patient. The employment of the various labyrinth operations for the purpose of draining the labyrinth merely

accomplish an end which nature can often handle to better advantage. Of course, if a meningitis has already supervened, which condition in our minds is the opprobrium of otology, then draining the meninges by Neumann's method or a more radical procedure recently described by Kahn is in order. But, as long as we are certain that the affection is purely intralabyrinthine, conservatism should be resorted to.

REPORT OF CASES.

CASE I.—Miss M. S., aged twenty-two, was referred to us by Dr. Siegfried Block, with the following symptoms: marked deafness, persistent nausea and vomiting, severe vertigo, with an inability to assume the erect posture without falling. These symptoms came on suddenly and at the time we saw her they were of three days' duration. The patient also complained of pain in the left ear which radiated to the left frontal and parietal regions. She gave a history of having had discharging ears since childhood. The left ear showed no tenderness over the mastoid with absence of edema. The canal was filled with thick, foul smelling pus, which after being wiped out disclosed an almost completely destroyed membrana tympani with a polyp springing from the inner wall of the tympanic cavity, which protruded into the canal. There was no sagging of the posterior superior canal wall. The right ear showed a tympanic membrane partially destroyed with granulations visible over the promontory wall. There was present a spontaneous rotary nystagmus fairly well marked directed to the right. This was intensified upon looking to the right. There was a complete loss of hearing in the left ear, although according to the patient's statements the hearing in this ear was much better than that in the right ear previous to the onset of the present condition. The right ear detected whispered voice at twelve feet. Bone conduction, using the 128 fork, was of thirteen seconds' duration. Lower tone limit was 64 d. v., and upper tones were not very much altered.

The temperature was 101° F., pulse 112, respirations 26. There was absence of both Kernig and Babinski, and spinal puncture showed a negative spinal fluid. There were no evidences of any intracranial complications, and we decided we were dealing with a case of acute diffuse suppurative labyrinthitis. We, in consequence, employed an expectant plan of treatment. The symptoms grew less severe day by day, and in two weeks were practically gone. Examination at this time disclosed the following: Hearing in left ear completely abolished. Hearing in right ear showed no change. Rotation to left, head erect, elicited an after horizontal nystagmus to the right of twenty-four seconds' duration. Rotation to the right elicited a weak after nystagmus of thirteen seconds' duration to the left.

Irrigation of the right ear with warm water was followed in forty-five seconds by an active nystagmus to the right, accompanied by the usual phenomena of vertigo, etc. Irrigation of the left ear with warm water after two minutes gave no response. We concluded, therefore, that we had a nonfunctioning left labyrinth, the result of the suppurating laby-

rinthitis, which, fortunately for the patient, remained intralabyrinthine. We advised a radical mastoidectomy, and performed the operation at the Bikur-Cholim Hospital several days later. The patient made an uneventful recovery. We have seen the patient at intervals of three months for the past year and a half, and we are pleased to state that there have been no recurrent symptoms of vestibular disturbance, and the ear has remained perfectly dry. Functionally the left ear is dead.

CASE II.—Mr. W. P., aged thirty-one, a salesman, had had a discharging left ear which dated back to an attack of scarlet fever when nine years of age. When we were asked to see the patient he had been ill in bed for a week, complaining of inability to walk about without falling, with nausea and vomiting. The onset of the present condition was sudden, coming on after an attack of acute rhinitis. For the last three days the severity of the symptoms had somewhat abated. The patient complained of only occasional shooting pains in the left ear which radiated back to the occiput. Otherwise the patient was fairly comfortable while in bed.

The left ear showed the presence of a moderate amount of discharge, which was characteristically foul. The drum membrane was completely destroyed and the inner tympanic wall was covered with granulation tissue. The right ear showed nothing abnormal, with the exception of some slight retraction. There was present a very weak rotatory nystagmus to the right, which was difficult to discern. However, upon looking to the extreme right, the nystagmus was considerably increased in intensity. There was complete loss of hearing in the left ear. The right ear showed no abnormal alterations.

Irrigation of the left ear with warm water gave no response after two minutes. Irrigation of the right ear with warm water produced a most violent effect. There was a marked rotatory nystagmus to the right after fifty-five seconds, and the vertigo was most extreme. The patient was seized with nausea and vomited several times. Two hours elapsed before the patient was again comfortable. From the findings here, we decided we were dealing with an acute diffuse suppurative labyrinthitis, which was purely intralabyrinthine with nothing to point to any extension of the process to the intracranial structures. The fact that the acute symptoms were abating showed that Nature was handling the process successfully, and hence, as in the previous case, we decided to follow the expectant plan. Thirteen days later we advised a radical mastoid operation, which we performed at the Williamsburgh Hospital. The patient made an uneventful recovery, and has never suffered from any inconvenience since. We have seen the patient twice during the past eight months, and on both occasions we have found a dry ear. The left labyrinth as in the previous case is dead.

These two cases exemplify those points we have tried to emphasize: first, that after cessation of our process the irritability of the labyrinth can be taken as an index as to whether our process was a suppurative one; second, as long as our process is intralabyrinthine, nothing should be done until the abatement of the acute symptoms; third, the radical

mastoid operation is all that is necessary. There is no necessity of disturbing the labyrinth.

CASE III.—R. B., aged two. During an attack of scarlet fever a double otitis media developed, which was treated by the general practitioner for a period of eleven days. The drums ruptured spontaneously and there followed a most profuse discharge. We were asked to see the child on the fifteenth day of its illness, and found the left drum membrane partially destroyed, and the right one presenting a large kidney shaped perforation in the posterior quadrant. The discharge from the ears was thick and abundant, and required frequent irrigations. At this time there were no evidences of pain or edema over the mastoid areas. The child apparently had only very little impairment of hearing. Nine days later we were again called in to see the child, but this time at the request of the parents. The history we obtained was as follows: Seven days previously the child began to vomit and had high fever. The mother described a movement of the child's eyes, stating that "The child could not hold its eyes quiet." We interpreted this movement, of course, as being a spontaneous nystagmus. The family physician was summoned, and he treated the child for a gastric upset, making light of the other attending symptoms of a condition which he no doubt failed to recognize. What apparently disturbed the parents most was the fact that the hearing had become greatly impaired. The child could not be attracted by the loudest shouting.

Our examination confirmed the fact that the child was totally deaf. There was no visible nystagmus at this time, and none could be induced by irrigation of either ear with warm water. This no doubt was a case of double acute diffuse purulent labyrinthitis following a severe attack of otitis media, which Nature handled very successfully. The attending physician overlooked the condition entirely, although even with an early diagnosis little could have been done.

We have seen the child a number of times during the past five months, and have found no change in his condition. The ears have remained dry ever since. The labyrinth and cochlea in both ears are virtually dead, and all that is left for the child is early instruction in lip reading when he becomes of age.

The sequence we have just described is not an uncommon one. It is oftentimes overlooked by the physician, and the mothers, when questioned in later years, do not recall any such picture. There is no doubt that many of the cases of deafness in children can be traced to such an origin.

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691 LAFAYETTE AVENUE.

Immanence of Health

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"An organism and its environment are one, just as the parts and activities of the organism are one, in the sense that though we can distinguish them, we cannot separate them unaltered, and consequently cannot understand or investigate one apart from the rest. It is literally true of life, and no mere metaphor, that the whole is in each of the parts."—John Scott Haldane, M. D., F. R. S. (Oxon).

Health is an immanent state, and it is our work to become conscious of this biological fact, endeavoring, understandingly, to work with and aid organic regulation to maintain this state, or helpfully aid when embarrassment appears.

As research workers, and clinical physicians, the foreground has loomed so full that perspective has been obscured or lost to relations and values. We have either lost or not attained to vision, biological perception. All real and helpful physicians are those of vision—those who see the human organism in its relation to total environments, the internal environment ever seeking harmonious reaction to external environment.

"We are gradually coming to realize how intensely delicate is the adjustment of immediate internal environment and organized structure involved in the existence of normal conditions, and the more we

realize this the more significant appears the process of recovery or adaptation."—John Scott Haldane.

We want to help organic regulation when seemingly embarrassed, but we now know we can help only to the extent we possess vision—understanding of the whole—the biological whole. We want to give the obvious or local only its portion of value in its relation to the whole.

Medicine is not only going to come, but is coming into her larger and true service; but this larger, truer service will be, and now is the rôle and privilege of the practitioner of vision—the vision of understanding—the understanding that demonstrates service.

"The physical and chemical picture is entirely obliterated by the picture of organism," and the clearer and more vitally we see the picture of organism and its organic relation, the better equipped we are, as physicians, to cooperate with organism in its law of adaptation and maintenance.

"The time has come for biology to liberate herself and step forth as a free, a living experimental science, with a world before her to conquer by the help of clearer ideas of what life is, and how it can be investigated."—Haldane.

We hold no impractical or unpracticable thoughts

concerning medicine and its immediate value to society, but we desire to hold progressive thoughts, and a willingness to work unceasingly to put granite under air castles. Something is needed—something more available and more helpful than we have been practising. The future of medicine is not discouraging, it is becoming more encouraging. We are emerging from darkness into light—from cynicism into confidence—confidence based on more scientific service and more successful issues. The future serviceable physician will be the one who understandingly works with organic regulation, not one ignorantly embarrassing her with the interference of partial knowledge.

Immanence of health: "But is there no scientific clue through this apparent maze? Does not the element of regulation which, as we have seen throughout, is the outstanding feature of biological prominence, furnish the clue?"—Haldane.

This primitive and inherent element of regulation—this wondrous, sensitive reaction of internal environment with external environment—this superintellectual and harmonious balancing of reactions in the human organism—in this biological phenomenon of activities must reside the immanence of health; and also the vital functions that are the direct curative agents or means of cure when the organism is embarrassed.

"Though the cure takes place locally at the site of disease, it is brought about by the action of the organism as a whole. This is a very important law of healing: Life as a whole heals disease (disease physically considered). It does not heal specifically by mercury, morphine, or any other drug, but heals by its functional reactions, especially by the processes of metabolism and development. What maintains life heals disease; or, in other words, reactions which maintain life when healthy will heal life when ill. . . . Even the adaptation cannot be regarded as specific, for we know that adaptation is a fundamental biological phenomenon, and not a specific one."

Consciousness of organism: Let us state with Dr. C. T. Minot, that "Consciousness is the most obscure problem of biology;" however, consciousness seems to "stand in immediate causal relation to physiological processes." Immanence of health seems, biologically, to be an externalizing of organic consciousness. Organic consciousness is not intellectual, but fortunately for man, it is superintellectual, an order of reaction that immeasurably transcends cerebral functioning. If it were not so, this wondrous "autonomic mechanism" would not, nor could not continue to express its biological phenomenon. Immanence of health is active consciousness operating its law of balance and maintenance in spite of inharmonious external environment.

We shall probably have to use physics and chemistry as categories through which biology seeks to reveal itself, until truer voices are heard. "The vital functions are the direct curative agents or means of cure. All the functions of the organism adapt themselves to heal."

In our present sense of means to aid embarrassed organism, the gland substances constituting the autonomic mechanism seem to effect the best and

fullest aid to embarrassed organism. The employment of desiccated gland substances given by the mouth, if associated in quantities that activate, rather than stimulate, seems to aid a disturbed functioning back to a more normal state of concentration and velocity of reaction.

If the human organism is expressing an altered or lowered reaction, it seems best to aid it back to a more normal rate of reaction through the administration of associated gland substances—gland substances possessing active properties—properties now called internal secretions and enzymes. These are administered with the belief that there is an insufficiency, or even absence, of these properties, or reaction agents, and that the administration of properly proportioned quantities of associated gland substances will aid the organism to return to a more normal rate of reaction, to express again the immanence of health.

In using gland substances in modern therapy, we should understand that we are administering these substances as endogenous substances, not as an exogenous influence, that we are supplying from without the organic properties that are inherent but seem deficient in the organism to which we administer them.

In the light of present understanding, associated gland therapy is the employment of activators, not stimulants, not exogenous influences to exalt function or reaction. The modern or better equipped therapist is a physiological, or still better, a biological therapist who seeks to perceive lowered reaction—lowered defence—and come to the relief of embarrassed organism with physiological aid—associated gland substances.

If there is any abiding truth or benefit in gland therapy, it depends upon the law of selection—selection of kind and quantity. This is why associated gland therapy is so much more rational and scientific than single gland therapy. If there is not a dependable law of selection in organic regulation, then we certainly have not intelligence enough to supply the needs of embarrassed organic regulation.

" . . . curative reactions are natural processes, and healing is nothing unusual or unnatural." With this concept as our guide, let us simply and only endeavor to work with the natural curative reactions. "In medical practice we cannot always treat disease without an operation or a drug." This statement all experienced practitioners understand, but what we are endeavoring to affirm is that in errors of metabolism we should hold in thought organic regulation, its law of correction and maintenance, and co-work with this law of organic regulation. We do not desire to assail clearly indicated medication or clearly indicated surgery, but we desire to affirm, over and above all "medicine" and "surgery" a larger, more inclusive sense of therapy.

" . . . the principle of healing is present. Healing is the principle of purposiveness or fitness, and disease is, therefore, up to a certain point, a teleographical or purposive process."

Relative to present knowledge of how effects in therapy are logically obtained: "Catalysis is only one instance of the general law of the transformation of potential into kinetic energy, viz., by the inter-

vention of a foreign exciting and stimulating energy which may be infinitely smaller than the energy it transforms."—S. Ludoc, 1911.

It is this activating property (activity) of catalysis to which associated gland substances owe their power to aid in the "transformation of potential into kinetic energy"—aiding in the restoration to a normal state of "velocity of reaction"—immanence of health.

Gland substances in association, and when selected by the best known means of standardization—gland substances in their most vital state—selected from young, healthy animals, and free from as much inert connective tissue and fat as possible, and when given to a human organism lowered in its reactions, do increase the rate of reaction—do aid the resident law of restoration to physiological balance.

Gland therapy, as we have stated in our previous articles, is but part of modern therapy, but, we believe, a very helpful part of physiological therapy.

"When we seek the cause of a physiological reaction, we are thus landed in a maze of contributing causes. We can wander in the maze for as long as we like, but there is no end to it." "An obvious possible interpretation is that each of the various organs concerned in the balancing process has such a physical and chemical structure that it reacts to a given small deviation in the internal environment so as to prevent further deviation in this direction. As the combined result of the reactions of all the organs, the internal environment remains constant."

"Up to a certain point we can rest satisfied in the idea that regulation of the internal medium depends upon the specific structures and corresponding reactions of the organs which bring about the regulation. But the more we learn about the delicacy and complexity of the regulating processes, the more definitely does a difficulty appear. It is not for nothing that the body regulates its internal environment so exactly. The investigations which reveal the exactitude of the regulation reveal equally its fundamental importance to the nutrition and normal working of every part of the body. The organs and tissues which regulate the internal environment are themselves centres of nutritional activity, dependent from moment to moment on their environment."

This paragraph from Haldane is a summary of what we would state as a basis for scientific co-operative therapy vs. ignorant interfering therapy.

Endocrine imbalance: The so-called endocrine organs are not only obviously interrelated but interdependent in functions. This seems a guide in endocrine therapy. ". . . a disturbance in the function of one of these organs involves a disturbance in the function of a larger or smaller number of the others." We have been holding this view for some time. When one "endocrine gland" functions, it sensitizes the whole endocrine cycle—when one is affected, all are affected.

If we may be allowed to condense a statement, we would say that lowering of health is the lowering of rate of reaction—lowering of "concentration and velocity of reaction"; and if this be the condition, the administration, as physiological aids, of associated, standardized gland substances is the indicated immediate therapy—but not all the therapy.

Costa stated that "nice distinction between condi-

tions due to the various ductless gland disorders are very difficult to make. . . . He does not attempt the differentiation suggested by Claud and Gaugerot, and others, to determine in which gland the hypofunction or hyperfunction predominates, and which is essentially responsible for the disturbance. This undertaking appears to him much too difficult at present."—L. Luciane.

This is what we desire to bring out—make clear, that we do not at present, at least, possess physiological knowledge enough to be able to determine accurately which gland is primarily involved. This is the scientific, and also the clinical, justification of giving gland substances in association—associated as they seem to be associated and act in the living normal human organism.

"It seems clear, therefore, that we cannot base our explanation of the constancy of the internal environment on the structure of the organs which regulate it, since closer examination shows that the structure of the organs is itself dependent on the constancy of the internal environment. We are only reasoning in a circle when we attempt to explain the constancy of the internal environment by the specific characters of bodily structure. The fact is that both the internal environment and the structure of the body remain approximately constant; but of this fact no explanation has been reached."

I am quoting freely from the larger and more enlightening suggestions of such research works as John Scott Haldane, as it is the vision of the masters that must lead us out of the darkness of our present Egypt toward the Promised Land—that understanding of physical phenomena from which may be deduced, at least, a fuller understanding, and truer, fuller vision.

As practical, practising physicians we are surely moving toward truer and more serviceable concepts in our work. We are thinking less in detachment, more in biological wholeness. In the improved service rendered by the understanding physician, medicine is attaining that high and noble rôle which has been its destiny. The physician is equipping to truly serve—not emotionally or dogmatically, but scientifically—scientifically in the biological sense.

"It is far more important for the patient that one should find out why his disease does not heal than that one should show him a bacillus as the ostensible cause of his illness." If the physician is to help and regain a merited confidence from the so-called laity, he must think and act in more inclusive thought than mere pathology or bacteriology. Let us know bacteriology and pathology and their claims; let us know more than pathology and bacteriology—more even than physics and chemistry—know them all as necessary knowledge, but not allowed to obtrude so obviously that they obscure the whole biological fact—the immanence of health.

We are emerging into a consciousness of primal truths, and we are rapidly arranging for the utilization of immanent law as the source of immanent health. Let us endeavor, as practical physicians, to cooperate with Nature—organic regulation—holding, as constantly and clearly as possible, the vision of the immanence of health.

17 EAST FORTY-SECOND STREET.

Syphilis

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Boston.

(Concluded from page 513.)

Now the effect of mercurials is directly dependent upon three factors, unless we are willing to admit that each separate form of drug possesses (some) inherent force different from every other form, or that it depends upon a difference of electric ionization which is different from every other compound, in which we are rapidly getting away from what at present seem to be facts and getting into the realms of unproved theory.

The investigations of Paul and Krönig and others seemed to prove that toxicity is dependent upon the disassociation and that it is not dependent upon the total amount of mercury salts present but rather upon the number of mercury ions but at present we know too little along these lines to be of any use.

The problem then resolves itself into first, the mercurial content of any preparation; second, the rate of absorption or utilizability by the system of various salts of mercury, and, third, the unknown factor which is inherent in a particular preparation or combination and about which we can only theorize.

Name	Mol. weight	Percent of mercury	1 c.c. of a 1 percent solution contains	
			Gm. Hg.	Grain Hg.
Mercury oxycyanate.....	484.	82.5	0.0083	0.126
Mercury bichloride.....	271.	74.—	0.0074	0.114
Mercury salicylate.....	336.	59.5	0.0060	0.091
Mercury succinimide.....	396.	50.5	0.0051	0.077
Mercury iodide.....	454.	44.—	0.0044	0.068
Calomel.....	235.5	84.—	0.0084	0.131
Mercury protoiodide.....	326.85	61.1—	0.0061	0.095
Mercury benzoate.....	442.	45.25	0.0045	0.0598
Mercury cyanide.....	252.62	79.4	0.0080	0.106

By looking at this table we shall find that if we take the preparation containing the highest percentage of mercury and use a one per cent. solution by injecting one c.c. of this preparation we shall be using twelve one hundredths of a grain of mercury or practically one eighth of a grain of mercury as metallic mercury. If we use mercuric iodide we shall be using only seven one hundredths or one fourteenth grain, and these two are advised in a comparatively small series of injections every two or three days.

Spitel of Ceylon uses approximately ten to twelve c.c. of a one fifth per cent. solution intravenously and uses an injection once a week. In other words he uses fourteen one hundredths of a grain of metallic mercury in the form of mercuric iodide, or one seventh grain of mercury once a week. It would seem that if there are any effects to be produced by this dose it certainly must be due to some unknown quantity and not to the mercurial content. If we used the benzoate we should be using only one twentieth grain of mercury as a dose. In using the insolubles, of mercurial salicylate one and one half grains would be for all practical purposes three fourths of a grain of mercury and of bichloride in one grain doses, which are usually advised as a maximum, he would receive approximately three fourths of a grain of metallic mer-

cury. But this would be only once a week and exactly how much mercury is absorbed and utilized by the economy is an unknown quantity, even more so than by mouth administration because certainly some of it is encapsulated and lost. Bastron uses mercuric chloride intravenously in much less than one per cent. solutions every two or three days. His total quantity in each dose is about one eleventh of a grain, eighty-two per cent. of which is metallic mercury. By mouth a patient takes three fourths of one grain of protoiodide of mercury a day, which is the preparation which we use, or appropriate doses of any other mercurial, and if a half is assimilated, which is much more than probable, because it can be clearly demonstrated that there is rapid absorption in this form, the patient would be receiving into his system at least one half grain, and of this sixty-one and one tenth per cent. is mercury as metallic mercury. So that while the patient might receive more he would certainly absorb at least one quarter grain of mercury as metallic mercury every day and probably much more. The coefficient of assimilation is, of course, unknown here also and varies under various conditions and I know of no experiments which have been made with mercury along these lines, but it is certain that they would be interesting. Riederer gave to a dog in thirty-one days 2.789 grams of calomel and recovered most of it in the feces but it was also generally distributed through the tissue and calomel is not a readily soluble salt of mercury.

SATURATION AS A GUIDE.

But we have a fairly definite guide to the administration of mercury, which is as good as any laboratory estimate, and this is the point of saturation or tolerance to mercury. This applies to intravenous or intramuscular injections, rubs or by mouth. This is salivation, ptyalism, and the proof of saturation with mercurials is to keep the patient near this point. I have used intramuscular injections of mercury in much greater doses than are ordinarily advised and I have used the soluble salts in much larger doses and much oftener than usual, and so far I have not been able to produce salivation within the limits of the preparations which I am willing to use by that method. I have no difficulty in producing it by the mouth administration of the drug and as I believe that it does not matter which method of administration is used, so long as the efforts of the mercury are produced I shall continue to use it that way and not chase off after strange gods whose worth remains unproved.

Three fourths to one grain usually, of mercury (hydrargyri iodide viridi) a day will do all that any form of mercury can do and the patients can be induced to keep it up indefinitely. After they have had a few intramuscular injections of the insol-

bles they are not anxious to continue and after they become symptomless they absolutely refuse.

REACTIONS.

The character of the various reactions has been too thoroughly discussed to warrant repetition. No matter what solution or what concentration is used there will be some reaction with any arsenical compound. Hyman of Boston from five hundred cases divides reaction into four types: Immediate class, one and two tenths per cent. reacted; class 2, nine and six tenths per cent. reacted; class 3, six tenths per cent. reacted, and class 4, two tenths per cent. reacted. Total, eleven and six tenths per cent. had reaction of some type.

The first type is immediate. The second type develops within twenty-four to forty-eight hours. May start within twenty minutes but usually about eight hours. Vomiting, severe headache, vertigo hyperpyrexia and pain. Diarrhea is common. Usually urine shows trace of albumin. Symptoms increase in severity for two to six hours and subside. This is most common reaction. The third type is not common. Idiosyncrasies or intolerance to arsenic. Several days or weeks after injection the patient begins to grow gradually weaker, pains, diarrhea, hematesis are not uncommon. There may be jaundice or cutaneous manifestations. Some state that atrophy of the liver occurs but none were reported in Hyman's cases. The fourth type is the so-called Herxheimer reaction. The patients present alarming cerebral symptoms. Hyman discusses the probability of a hyperalkaline solution causing some of these reactions.

In Rush Medical College in 4520 injections the following reactions of some type were observed: Arsenobenzol, one and five tenths per cent.; neoarsenobenzol, one and seven tenths per cent.; salvarsan, eight and eight tenths per cent., and diarsenol, nine and six tenths per cent.

CAUSE OF INTOLERANCE.

Groubeau of Paris divides his reactions into two types: First type only observed in active syphilitic cases, which he called immediate or injection fever. The late manifestation was an intolerance to the drug. Others do not agree with him. They think intolerance comes more frequently soon after the injection. Milian of Paris attributes symptoms to vasodilatation the effect of the arsenic acting on a patient with insufficient adrenalin and calls the reactions nitratoid crises. Hitch does not agree with Milian and reports two cases of epileptoid seizures with death forty-eight hours after six tenths gram. Pardo of Havana says nitratoid crises are not anaphylactic because small doses previously do not ward off an attack, while adrenaline does. He thinks it is due to the vasodilatation effect of the drug. He reports one case of serous apoplexy with recovery following adrenalin injections. He says serous apoplexy is one phase of this nitratoid reaction. He believes contraindication to be reduced to cardiac and nerve lesions with lost compensation and extreme cachexia. Most of the French workers are beginning to believe that the only contraindication to this drug is impermeability of the kidney. Strathy of London reports jaundice

in forty-eight cases with eight deaths. Atrophy of the liver was marked. Hallam reports jaundice and says it occurs with varying frequency in all clinics and that the patients usually recover. Lynch and Hoge say toxic jaundice follows intensive administration of 606 and say that the delayed symptoms should be differentiated from the arsenical symptoms coming on at once, viz: vomiting, diarrhea and skin eruptions. They report three cases of toxic jaundice of their own and three other cases from the British journals. All their cases showed a tubular nephritis. Only one patient of theirs died but the three other patients succumbed. The liver was small but did not favor any of the more common forms of cirrhosis. This does not seem to agree with Strathy's larger series. That jaundice is due to the action of the arsenicals or to the benzol ring is probable but it may be due to syphilis. Osler says jaundice is not frequent in syphilis but in St. George's Hospital George O. Scott in 11,629 autopsies found 611 cases of syphilitic livers and in the Philadelphia Hospital, in 5,088 autopsies, there were 188 cases of liver syphilis. Ravaut in 94,762 injections of various arsenicals had only twenty cases of jaundice.

Foulerton of England thinks the toxic jaundice akin to that produced by chloroform and ether, which are active fat solvents, or like phosphorus, dinitrobenzine or trinitrotoluene, which are readily soluble in fats and may not be due to the arsenical content at all but more to the benzol ring.

Leary of Boston, medical examiner and professor of pathology at Tufts, after many autopsies on deaths from 606, comes to the conclusion that they are due to some toxic principles other than arsenic and that the main pathology consists of small subperitoneal hemorrhages present in most of the cases. He believes that the toxic principals may be due to unneutralized acidity of the solution used.

We confess that we can not understand these percentages of reaction if all the reactions, slight or otherwise, are included. Under the old treatment, with larger quantities of solution, a reaction of some kind in our experience was to be expected. They were slight, we admit, in most cases, but most of them exhibited a slight headache, nearly all cases showed nausea, many of the patients vomited and most of them had diarrhea. With the concentration of our solution to twelve to fifteen c.c. of water the change for the better, in our experience, became marked. But still many of the patients showed a slight reaction, some severe, especially when large doses were used. Fully twenty per cent of these showed slight nausea, some vomited and over forty per cent. had slight diarrhea. We can not reconcile our findings with the findings of others who report only eleven per cent. of reactions while using the old solution.

STEVENS'S CLASSIFICATION OF REACTIONS.

First Type.—Immediate or soon after injection. Nitratoid, due to the presence of some of the ONO group not being converted by the nascent hydrogen into the NH_2 of the finished product. The finished formula is $(\text{O}_2\text{H}_2)_2, (\text{NH}_2)_2, \text{As}_2, (\text{OH})_2$, all of the N in the ONO having been converted into NH_2 .

Second Type.—Coming on from four to twenty-four hours after injection. Nausea, vomiting, diarrhea, slight fever,

due to the reaction of the economy to the solution; possibly arsenical, but not entirely due to the arsenic. Other factors including the bulk of the injection must be considered. This reaction was common with the old solutions. It is less with the concentrated, but is the most common reaction of all.

Third Type.—a, Serous apoplexies; b, tubular nephritis. Usually after several days. They are probably linked together as phases of the same reaction, and may be due to impermeability of the kidney to arsenic.

Fourth Type.—Jaundice, usually delayed. May be due to arsenical idiosyncrasy or more likely to the benzol constituent of the medication in combination with the lipoids of the body. It may be a syphilitic liver manifestation.

LATER SERIES.

Neosalvarsan, old German neosalvarsan and American made neosalvarsan were used in a solution of fifteen c. c. of water. In one hundred cases there were twenty per cent. of reactions of some kind, mostly slight, nausea, and diarrhea coming on in four to eight hours and of little importance, slight headache; three real nitratoids, no serous apoplexies. There was one death, probably not due to 606. Autopsy showed no pial hemorrhages and no kidney or liver involvement, no jaundice. We report it for what it is worth.

Neosalvarsan, German, Metz, Schamberg, Japanese, were used in two c. c. of water. In one hundred cases there were reactions of some type in eight per cent., mostly slight. There were two real nitratoids, one pseudonitratoid or mild nitratoid, five had nausea or vomited, none complained of diarrhea, none had jaundice, none had albumen. There were no serous apoplexies, and no deaths. None of the patients receiving one half to one c. c. adrenalin before administration had anything except a fast heart from the adrenalin.

In the last fifty cases other than the above we have given one half c. c. of one to 1,000 adrenalin in every case, believing it better to give this drug to many who may not need it rather than wait for the reactions to occur in a limited number of cases. There have been no reactions of any type except a slight nausea in a few cases, coming on in from four to six hours after injection. There was no vomiting and no diarrhea. A temporary fast pulse will result in some of these cases from the adrenalin.

So that out of the mass of statements and misstatements comes a fairly definite conclusion. That there will be a reaction with any preparation of the arsenicals and that there will occasionally be a death which can be directly attributed to their use. The cause is still *sub judice*.

We are all interested in the handling of these cases not alone along medical lines but from the wider viewpoint of social economics. As we have said we do not anticipate much from Government or State cooperation in prevention. How then are we to accomplish much? Along two lines only can we see hope for improvement: First, by the general dissemination of knowledge and second, through the general practitioner by simplification of technic.

There is nothing extremely difficult in intravenous medication even today and the injection of the arsenical preparations is not particularly difficult nor particularly dangerous. There have been some deaths, to be sure, that could be traced directly to the use of the arsenicals in medicine but the danger from the disease is so much greater than any danger

from the medication that it may be practically disregarded. With simplification of technic the general practitioner is the logical man to handle this problem. (Of course it is understood that we are speaking of the ordinary primary or secondary syphilis and not the locomotor cases, the general paresis cases or the cases which require special care.)

The real attack which we must make on the problem comes with this simplification of technic because the general practitioner is the logical syphilologist and for every case of syphilis that consults the specialist or the man versed in the technic of intravenous medication there are one hundred who never get away from the general practitioner. He comes into contact with the cases first and he remains in contact with them over long periods of years. He knows long before any one of any impending danger but too often he is of the type who has had the dangers of intravenous medication too vividly impressed upon him and the great care which must be used in the manipulation of these medicaments. Again, where larger quantities of fluid have been used with much paraphernalia, accentuation of the minutiae and the importance of sterilization, both he and the patient have come to consider it as an operation and to look forward with dread equal to the dread of the disease. If these conditions are permitted to continue we shall not arrive anywhere in the solution of this problem of dealing efficiently with syphilitics.

We must instruct general practitioners in this problem of intravenous medication and we must do away with much of the paraphernalia of the operating room so these patients will come long enough to receive adequate treatment. Time is a great healer. Tomorrow we shall have forgotten the fears of today. The syphilitic today talks of suicide, tomorrow he is reconciled, the day after tomorrow, unless he sees symptoms of his disease, he is likely to forget. And so long as he can see no signs he can be depended upon to put off his treatment, which he considers in the light of an operation. He visualizes the long tubes and the (to him) quart of solution which is to be run into his veins. He remembers the nausea, the headache, the vomiting and the enforced rest and he puts it off. Can we blame him? Yet the main point is to administer 0.60 or 0.90 of neosalvarsan. The great quantities of water are not an advantage but a detriment with the neosalvarsan. McCoy, director of the United States Public Health Service, warns all users of arsphenamine solution not to use more than one tenth in thirty c. c. of fluid and allow two minutes for each thirty c. c. injection. Hyman says that McCoy's statements have been too emphatic to meet with general acceptance by the medical profession. There is no need for further comment on these opinions.

Six years ago we became convinced that the main symptoms, which came on soon after injection, nausea, vomiting and diarrhea, which we had seen frequently, were the result of some other factor than neosalvarsan and we began to concentrate our solution little by little. In one hundred cases we have used two c. c. of distilled water to our doses of neosalvarsan and we have seen the nausea, the vomiting, the diarrhea and the headaches vanish. The primaries have disappeared just as promptly as be-

fore; the secondaries likewise. There has not been a Herxheimer reaction and only two nitratoid crises. The whole thing is as simple as an ordinary hyperdermic injection. We use fine needles and our patients no longer fear to continue our treatment.

We use freshly distilled water, but we have also used ordinary boiled tap water, and have never been able to convince ourselves of any difference. Every practitioner of medicine has a two c. c. glass hypodermic syringe and a boiler. Throw syringe and needle into boiling water and boil for ten minutes with a small pledget of cotton, being careful not to touch the needle when removing it. Bury the needle in the pledget of boiled cotton and aspirate two c. c. of water into the barrel. Put the two c. c. of water in a glass graduate, previously boiled, shake in the contents of the neoarsenobenzol, or use the ampoule itself for the solution. It dissolves slowly, especially the American preparations. Fill the syringe and with a rubber tube on the patient's arm or by pressure of the left hand, distend the patient's veins at the elbow and pass the needle into the vein. Snap off the tourniquet or remove the hand and before injecting draw out the piston just a little. If blood follows it you are still in the vein. Inject very slowly, drop by drop. This is the secret of success. Seal the puncture with collodion. We test all solutions on litmus paper to be sure of alkalinity.

If there is going to be a reaction it will come on within ten minutes usually, but slowness of injection to allow the blood stream to wash away and dilute the solution, is, we believe, the crux of the whole matter. Select as large a vein as possible to secure a volume of blood. We use eight injections at five to seven day intervals, except in primary cases where we use the first three every other day and two such series during the first year and often three, the first of eight injections and the second and third of six injections. The second year we use at least two series, and the third year one, if negative serologically, and the fourth year one. Intercurrently we use mercury by mouth, three months at a time, twice a year for four years.

We have never given mercurials intravenously except in six cases experimentally, and we have never believed in this method or the intramuscular injection of mercury. While we use the Wassermann test as a check in our cases we do not permit ourselves to be influenced by it as regards treatment. Our cases in the old days, when we were using the original salvarsan and large volumes of water, or the novarsenobenzol with larger quantities of water than at present, did not become Wassermann free with that celerity which has been so often reported by some observers. Many of them went over into the second year with plus Wassermann in those days and some do still. In two out of one hundred cases of two years or over, there is still a positive Wassermann which nothing seems to change. In one hundred cases, some few receiving fifteen c. c. of solution, seventy-nine became Wassermann negative within six months; twenty per cent. of these relapsed with our treatment and became negative within one year on further treatment; fifteen others became negative within one year, seven relapsed to become again negative; three became negative within

one and a half years, one within two years, and two cases are plus after more than two years. None of these received more than fifteen c. c. of fluid. Of the last one hundred cases all have received only two c. c. of fluid. We base our doses on twenty-five pounds of body weight to fifteen hundredths of neosalvarsan. In two a typical nitratoid crisis occurred within ten minutes; in one tachycardia 140, temperature 104, flushed face, beating in the head, dizziness, vomiting, no albumin, recovery. There have been no cases of more than temporary reaction with less than 0.90, one with slight flushing of face and pounding in head which wore away in a short time. No albumin in those patients who did not have it before, no diarrhea in any of the patients, a few had nausea and five vomited. None had jaundice and none died.

Our preparations have been neosalvarsan, German neosalvarsan, and lately neosalvarsan of Metz. We have used Schamberg's and the Japanese preparations. We do not think the neosalvarsan of Metz or the others compare with the old German neosalvarsan, but we believe it as good as we can obtain at present. The Schamberg preparation seems to be more readily soluble and with this preparation we have never had a reaction other than slight nausea but our series is too small to draw definite conclusions. We have no reason for thinking that reactions will be less than with other preparations.

This, then, is our idea of how we may best combat what we believe to be the increase in the syphilization of the population of the United States:

1. The syphilization of the people of the United States is progressing rapidly.
2. Little can be expected of governmental supervision as long as our political system controls medical supervision.
3. Until we can devise some simplification of technic which will place the treatment of primary syphilis in the hands of the general practitioner we shall not accomplish much by treatment.
4. We believe that this simplification may be an entering wedge which may be improved later with further simplification.
5. There are fewer bad results in the use of arsenicals with the concentrated solution.
6. Syphilis reacts to concentrated arsenicals just as rapidly as with the more dilute solutions.
7. Reactions occurring with the concentrated solution are usually milder than by the more dilute solution. They come on at once if at all and so may be immediately treated. Adrenalin, in every case that shows reaction, fifteen to twenty minutes before administration will prevent a repetition. The nitratoid is the only type of reaction to be expected with the concentrated solution.
8. Reaction once established in a patient will invariably recur thereafter without regard to dose unless adrenalin is used. This applies to a series only. After a rest of several months reaction may not follow in cases which previously reacted.
9. The mercurials are of value when used to the point of tolerance and kept there. This can be done best either by mouth or by inunction. To expect results from most of the doses recommended is an absurdity.

A Contribution to the Mercurial Therapeusis of Syphilis

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(Concluded from page 536.)

TERTIARY SYPHILIS (ACTIVE)

Ser. No. and name	Wassermann dates	Kind of Treatment Ars. as "606" Mercurials Mercurosal	Wassermann Test	Clinical notes
26. A. A.	12/ 7/'16	"606"—4 inj. Hg. many NS .9 Hg. Salic. 6	+ +	Primary '13? On admission, partial paralysis of vocal cords, "rheumatic" pain of extremities, beginning tabetic gait, headaches, dizzy spells.
	1/ 8/'17	NS .4 Hg. Salic. 5 M'l 3-3 c.c.	±	
	2/22/'17	NS .5 M'l 6-8 c.c.	+ + +	Pains much improved, headaches persist.
	4/ 6/'17	M'l 8-16 c.c.	+	
	6/ 9/'17	M'l 3-10 c.c.	±	Vocal condition better, walking improved.
	7/18/'17	M'l 2-8 c.c.	±	
	9/ 6/'17	M'l 7-27 c.c.	+	Patient feels very comfortable.
	1/16/'18		+ + + +	
	8/27/'18	M'l 3-15 c.c.	+	Relapse only serological. Clinically feeling well, she discontinued treatment until 8/27/'18, when she resumed treatment until 12/21/'18.
	4/25/'19	M'l 4-20 c.c.		Resumed treatment. Now has left ocular ptosis, vocal and joint conditions worse.
	6/ 9/'19	AB .6 KI by mouth. AB .6 M'l 5-20 c.c.	+	Condition getting worse, partial paralysis of vocal cords and muscles of deglutition. Dizziness, losing weight steadily.
9/26/'19	S. Fluid M'l 7-20 c.c. KI by mouth.	±	Lumbar puncture done; fluid under marked pressure, chemical tests negative, cells 7 lymph., colloidal gold test, meningeal curve.	
11/ 9/'19			Died suddenly at home following an attack of dyspnea.	
27. G. J.	8/21/'16	"606"—12 inj. Hg. many OS .6 Hg. Ointm. NS .9 Hg. Salic. 5	+ + +	Primary '13. On admission, numerous tertiary cutaneous lesions, stomatitis, nephritis.
	10/18/'16	NS .9 Hg. Benz. 3 Hg. Ointm.	+	Specific stomatitis, cystitis, nephritis, continued. Syphilids fading gradually. Syphilids spreading more, new lesions developing on legs.
	11/27/'16	Hg. Benz. 4	+ +	Developed signs of mercurialism; salivation, sore gums. More cutaneous syphilids in arms, moist ulcers of scrotum. Stopped treatment.
	12/28/'16	Hg. Benz. 2	+ +	
	2/ 1/'17			No improvement in general condition.
	3/14/'19	M'l 30-150 c.c.	+ +	Nephritis, cystitis persist, syphilids spreading. Stopped treatment until 3/14/'19.
	6/ 5/'19		±	Immediate response to Mercurosal treatment. Cystitis cleared, faint trace of albumin in urine, lesions healed, gained 35 pounds.
	1/20/'21	AB .6	±	General condition very satisfactory.
				Left for South.
	28. S. G.	1/28/'18	AB .5 DA .6 M'l 4-24 c.c.	+ + +	Primary unknown. A month before the condition was diagnosed as lues, patient was treated for gout of the right toe. Due to an ingrown toe nail an incision was made which later developed into a typical luetic ulcer. Blood Wassermann was 3 plus.
2/19/'18		M'l 7-35 c.c.	—	
3/13/'18			—	
4/20/'18		AB .6 AB .3 M'l 6-30 c.c.	—	Ulcer healed, pain subsided.
7/11/'18			—	Patient discontinued treatment.
12/31/'20			—	Patient in excellent health.
\ TERTIARY LUES (LATENT)				
29. G. B.	8/12/'16	"606"—3 inj. Hg. many Hg. Benz. 3 M'l 2-5 c.c.	+ + +	Primary '13. On admission, no symptoms or signs of lues, except for a positive Wassermann. This case was an instance of a persistent positive Wassermann in spite of the vigorous mercurial treatment.
	2/24/'17	NS .4 Hg. Ointm. M'l 10-50 c.c.	+ +	
	4/30/'18	M'l 3-15 c.c.	±	
	10/28/'18		—	Patient discontinued treatment.
30. T. A.	2/ 3/'17	Hg. inj. many NS .9 M'l 5-30 c.c.	+ + + +	Primary '12. On admission, patient free of symptoms. There was, however, moderate lymphadenitis and a probable gumma of the tibia.
	7/ 5/'17	AB .6 M'l 2-6 c.c.	±	
	9/ 8/'17		±	Discontinued treatment until 7/2/'18.
	7/ 2/'18	M'l 7-37 c.c.	+	Tenderness and swelling of tibia gone.
	8/ 1/'18		+	Patient left for Europe.
	12/25/'18	M'l 11-54 c.c.	—	Returned 12/25/'18.
	3/19/'19	M'l 6-30 c.c.	+	
4/10/'19		—	Left again for Europe.	
7/25/'20		+ +	Returned 7/25/'20. Discontinued treatment.	

Ser. No. and name	Wassermann dates	(Kind of Treatment) Ars. as "606" Mercurials	Wassermann Test	Clinical notes	
31. C. G.	9/ 4/'17	"606" and Hg. many OS .6 Hg. Salic. 4	+ +	Primary '13. On admission, no signs or symptoms of active lues except the positive Wassermann which despite four years' treatment with numerous injections of 606 and Hg. never came down to negative.	
	10/22/'17	OS .4 Hg. Salic. 6	+		
	12/24/'17		+	No treatment from 12/24/'17 to 5/6/'18.	
	5/ 6/'18	AB .6 M'l 5-30 c.c.	+		
	7/ 4/'18	M'l 13-64 c.c.	-	Gained over twenty pounds in weight.	
	2/21/'19		±		
	3/11/'19		±		
	10/11/'19		-		
	32. G. K.	3/10/'20		-	Married over two years, wife's blood negative.
		10/14/'18	"606"—15 inj. AB .6 M'l 3-16 c.c.	+ +	Primary '15? or earlier. Non-symptomatic lues of long standing. Previous treatment limited to "606"—fifteen injections. The last Wassermann before admission was positive on 9/21/'18.
10/28/'18		M'l 5-27 c.c.	+		
11/15/'18		M'l 7-40 c.c.	+		
3/15/'19		M'l 5-25 c.c.	±		
6/20/'19		M'l 5-25 c.c.	-	Gained over thirty pounds in weight. Discontinued treatment.	
12/ 3/'19		M'l 7-25 c.c.	-		
3/ 1/'20			-		
10/24/'20			-		
33. J. D.		5/ 9/'19	Hg. by mouth and inj. AB .6 M'l 1-5 c.c.	+ + + +	Primary '13, with multiple ulcers on glans penis that were treated locally. In addition he underwent vigorous Hg. treatment, both by mouth and intramuscularly.
	5/23/'19	AB .6 M'l 2-10 c.c.	+		
	7/ 6/'19	AB .6 M'l 8-30 c.c.	+	Had three positive Wassermans by Board of Health; 2/25/'19—4 plus, 3/28/'19—doubtful, 4/8/'19—4 plus.	
	10/27/'19	M'l 4-13 c.c.	+		
	11/27/'19		+	On admission, no clinical manifestations of lues. Discontinued treatment.	
	5/ 1/'20	AB .6 M'l 3-15 c.c.	+ +		
	5/31/'20		±		
35. J. A.	10/24/'20	"606"—7 inj. Hg. 50 inj. SS .9 M'l 5-25 c.c.	+ + + +	Primary '05. Previous treatment "606"—7, Hg.—50 injections. On admission, no active lesions or signs. Previous positive Wassermans by Board of Health, last one two months ago, 4 plus.	
	11/30/'20	NS .6 M'l 7-30 c.c.	+ +		
	1/16/'21	NS .6 M'l 7-35 c.c.	+	Wassermann was persistently positive for the last year despite vigorous treatment. Discontinued treatment. Gained ten pounds in weight.	
	3/29/'21	M'l 6-25 c.c.	±		
	7/ 4/'21		±		

¹ Report of Case XXXIV will appear in authors' reprints.

REMARKS.

The great majority of tertiary cases that come under the observation of the practitioner are the so-called "treatment resistant" cases, in which a persistently positive Wassermann test is probably the only clinical manifestation. The trying experience of the practitioner in treating this class of cases is too well known for description. From our list we have selected only seven to represent the various phases, and to these we have added three clinically active, symptomatic cases, similarly with persistent Wassermann tests.

Our results uniformly lead us to conclude that, whereas salvarsan stands as the drug of choice in primary and secondary stages, it falls short of accomplishing the desired end in tertiaries, with the exception of certain active conditions, viz., visceral lues, gummata, etc. On the other hand, mercury from its position as an adjuvant to arsenic in primary and secondary infections, acquires the prime position in tertiary cases.

CONCLUSIONS.

In our opinion, in primary infections, salvarsan alone can accomplish the work, and, together with mercury, can manage advantageously the secondaries. Beginning with tertiaries, mercury takes the

lead, with salvarsan as adjuvant in active, and probably alone in latent nonsymptomatic luetics.

In other words, in arsenic and mercury we possess two valuable drugs acting on lues from its two extreme clinical stages; where one manifests its maximum efficiency the other is at its minimum with an intersection of their therapeutic intensities in late secondaries and early tertiaries. There is, however, a marked difference; salvarsan can eradicate the disease at its primary stage; mercury can only subdue it in its tertiary form. Let us not lose sight of the fact that it is the synthetic arsenic 606 and not arsenic *per se* that accomplishes the cure in primary cases.

For the time being we avail ourselves of the distinctive advantages offered by this new synthetic mercurial, whose solubility in water together with its low toxicity and high efficiency leave nothing to be desired when compared with the old list of mercurials in common use.

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Editorial Articles

CANCER CURES.

Throughout the history of medicine cancer has remained a dark mystery. Recently we have gained some knowledge through gross and microscopic pathological findings and a bit about the physiopathology. We found a disordered function of cell reproduction causing disorders in metabolism and finally in the functioning of the body as a whole. Some of the problems of metastases and of certain apparent causative factors have also been worked out. In our therapeutic endeavors surgery has given us much hope when the initial growths were discovered early and were accessible. The nonsurgical treatment of cancer has many advocates. But owing to the little known mechanism of the anarchical cell activities underlying the initial process little has been done in the way of prophylaxis.

Recently the treatment of cancer by radium and the x ray has caused much discussion and speculation. Whether we can look upon this mode of treatment as surgical, physical, or as an adjuvant of surgery, matters little! Some more conservative workers assert that the best results are a combination of surgery and radioactive rays, while the more radical insist that proper raying is the most effective. Deaver, Blake, and many other surgeons state that little reliance can be placed upon these procedures and that early surgical intervention remains the safest procedure. The advocates of early surgery, radiological treatment, and strictly medicinal therapy, all insist that their results are the best. The general practitioner remains at sea. He is obliged to listen, to depend upon statistics, and finally to rely upon some specialist in whom he has confidence. The patient is even more bewildered; in case of failure doubts are manifested, and the question raised of the "other method" being the one of choice.

It is not within the scope of this article to advocate any one method as being more advantageous than another, or to decry any endeavor that might be made along therapeutic lines. But a few suggestions will be offered. First, it would be well if the various workers in cancer therapy would get together and obtain a better knowledge of each other's methods and results. Second, more careful and complete statistics should be assembled and made available. It is understood that the same methods as those used by various workers will give divergent results depending on individual skill and judgment. Third, it would be more advantageous to a fuller

knowledge of cancer as a disease if centres could be established in various districts where all cancer patients could be sent for treatment. Finally, and most important of all, we should endeavor to secure a better understanding of the underlying primary causes of the initial processes. Here all therapists begin to lose their vital interest, for they feel that, as far as cancer is concerned, their duty is to cure and at best they wish to see the patient in the early stages of the disease. Their aim, however, should be to prevent the prospective cancer victim from becoming a patient.

One of the most interesting hypotheses recently advanced is the one of cell sexuality wherein the disordered sexual attitude is represented by a disordered sexuality of the cell symbolically. Another important factor is the postural tonus of the individual which is of psychic origin, various segmented tensions being caused by and in turn causing affective states. Just as we know that the diabetic disorders, gastric ulcers, and numberless other pathological conditions are brought about by psychic reactions, so may cancer be brought about. Following this line of investigation seems to be most fruitful. We should know more about the initial processes in the incipient stages. We should always look into the problems and wishes of the individual and regard him as an entity, rather than to glue our eyes to microscopes and quibble as to what particular type of cell division has taken place within the organism.

WORLD ECONOMICS AND THE PESTILENCES.

We have just witnessed the official termination of an inconclusive war—inconclusive because it has settled nothing on any subject, despite the fact that it engaged directly or indirectly three fourths of the estimated population of the world. During the period of the war, peaceful avocations of every kind were neglected, with the result that there is at present a shortage of all necessities of life, and the production of food, raw materials and manufactured articles is on such an economic basis that the world cannot afford to consume them. The balance between production and consumption is slowly being struck, but in the meantime whole populations have reverted to the living standards of the Middle Ages with a coincident retrogression of sanitary conditions and the concomitant outbreak of influenza and typhus epidemics, the type diseases of the Middle

Ages. People who cannot afford food cannot buy personal cleanliness, hence the diseases of bodily filth, vermin and overcrowding flourish.

The international spread of disease is governed by the state of world commerce, therefore, while plague thrives locally in many parts of the world, it has not as yet opened up distinctly new areas of conquest. This arises from the fact that plague is essentially a ship borne disease, spreading locally in times of economic depression, and invading new territory only when prosperity quickens international trade. Maritime commerce is now at low ebb, for the reason that when a nonproducing world bowed down by the debt of war cannot buy, shipping limits its movement to the minimum.

Gradually, the economic imbalance will be overcome and with a return to a normal trade status there will be an improvement in living conditions. A lag between prosperity and sanitation is to be expected, however, because hunger is a greater urge than the desire for personal and community cleanliness, but with the increase in material well being there will occur a recession of typhus.

In the meantime, plague will have strongly entrenched itself in the world's great terminal ports, and with the increase of commerce its further diffusion will be inevitable unless steps are taken now to control the disease in its present foci, and to prevent embarkation therefrom and debarkation at other points.

It is extremely doubtful if any government, within whose borders plague now exists, with the exception of the United States, is financially able to undertake the eradication and permanent exclusion of the disease. It is equally doubtful if any collection of governments by sanitary convention is able to control effectually the spread of plague. Each government by the application of a rational maritime quarantine with periodical ship fumigation may temporize with the danger, but it will remain an ever present threat and on the slightest lowering of the barrier it will gain entrance.

The dark present and the gloomy future have one bright spot. In spite of the enormous general loss growing out of the world conflict, there remain many vast private fortunes—tremendous hoards whose owners are conscientiously striving to reduce by benefactions to great humanitarian movements. Just as the Rockefeller Commission has driven yellow fever back to its last lair, so a properly organized and well backed plague commission could bring expert guidance and assistance to those world ports from which Black Death will recommence its hegira once maritime commerce is again on its feet, unless active steps are taken now.

WHAT IS CRIMINALITY?

The continuance of the "crime wave" gives a pertinency to any really enlightening discussion of the subject of criminality. What is the criminal and why are crimes committed are questions of more than academic or of passing popular interest. They thrust themselves before the consideration first of all of a practical medical psychology. Doctor Hollander has incorporated these problems into his scientific study of mind and body in their interrelation in man's character. [Bernard Hollander, M. D., *In Search of the Soul*. London and New York. Reviewed in this issue.] We have not advanced so far yet that it is superfluous for him to call attention to the common fallacy "that a good man *wills* to be virtuous, and a bad man *wills* to be vicious, and that either might *will* equally easily the opposite character." Law itself is based upon an inadequate conception of the relative strength of the emotional or impulsive life and of intellect to control it.

Nor is control by the intellect, if it exists, so simple a thing as the mere willing to choose a path of virtue. Not in the so-called criminal class alone does this hold true. Hollander does not allow himself to overlook the fact that "in spite of improved civilization and remedial measures the wickedness and the all devouring selfishness of man has not lessened; it is only artificially dammed in by the dykes of the law and of civil society." He goes on to speak of the "more clever rogues, who know how to keep their attacks on their neighbors' property within the letter of the law." He arraigns no more severely the men who accomplish this than the society whose blindness distinguishes falsely between this and the less clever class of wrongdoer: "The man who amasses great wealth by grinding down the poor, by cornering the necessities of life, or by sucking the lifeblood out of the toiler; the unscrupulous financier who robs his credulous dupes—these because of their money are eligible for peerages; the less refined criminal goes to gaol. The former hide their guilt and salve their conscience by giving millions—though still only a fraction of their wealth—to charity. Society is indulgent to the fraudulent financier, who lives to rob, and hard on the larceny fellow, who robs to live."

But Hollander is not writing an economic or political treatise. These facts are stated as a glaring illustration of ignorance as to the nature of the criminal. Their statement is a reminder of the presence in all men of the impulses which serve self-interest. The difference between these men accepted by society and those condemned as criminals is due to a different form of exercising or restraining these impulses or propensities. This difference is the re-

sult of difference in intellectual capacity and development which in turn is due to difference in hereditary and environmental factors. The writer does not commit all persons to the classification of acting criminals of the one sort or the other. There are those in whom the animal impulses are just active enough to satisfy them but in whom intellect and moral feeling, established by heredity and environment, habitually exercise such control that the commission of crime would be practically impossible. Virtue is so natural to them that they fail to see that it may be otherwise with the criminal. They have only "indignation and resentment" toward him. That such feelings may have also a deeper basis in their repressive selfdefense against the same impulses within themselves Hollander does not definitely remark.

There are others in whom heredity and environment have failed to produce such a condition of higher control. As intellect and moral sense are relatively weak the animal propensities are more ready to dominate action. The intellect that is present has an incorrect perception of the relation of things so that it is likely only to be enlisted in the criminal carrying out of the impulse that dominates it. With still others there is a more equal balance toward the elements making for self-indulgence or its restraint. The balance swings easily either way. Circumstances readily make criminals of such or turn them to better action. Special consideration must also be given to the large number of individuals whose intellectual incapacity is dependent upon defective or diseased brain conditions and those whose impulses are more or less completely swayed by the false reasoning of phantasy, that is, the insane or the feebleminded of varying degrees and kinds.

All this puts upon society a heavy burden of responsibility. She has not alone to determine in each case the relative strength of intellectual and moral control. And this forces the attention back upon preceding conditions of inheritance and environment. It is incumbent also to base upon the facts ascertained the treatment to be meted out. The impulses or propensities represent wishes which arise out of the nature of the human life. The wish is in its nature ineradicable and, as Hollander has said, no punishment can wipe it out. Punishment has sometimes served to restrain it; but it has not always done that. It is indisputable that some are so little capable of development that society must act as a restraining agent. Others need more favorable opportunity, together with education and development toward a selfrestraint which hitherto they had not learned. It is to be remembered that conformity to

prison rules is not adjustment to the far more complex conditions outside, so that in detention with restraint there is not a reeducation for social life. It is neither sentimental indulgence nor lack of protection that is advocated. There is no reform in either of these. Society, however, serves the best law of protection through an understanding of the criminal, his criminal behavior, and the limitations as well as the possibilities of development of his powers of control.

INCINERATION OF LATRINE CONTENTS.

One of the lessons learned during the war, or at least acutely emphasized, was the importance of the immediate incineration of latrine contents in preventing the spread of infection. The knowledge in this direction gained in war time will be of great value in civil life, in connection with camps, as incineration appears to be both simple and effective.

At the annual meeting of the British Society of Medical Officers of Health, held in London on September 30th, Major General Sir W. G. McPherson read a paper on the disposal of latrine contents, with special reference to immediate incineration. He pointed out that the prejudice against this system was due to ignorance of its advantages and he went on to describe the appalling conditions produced by the prolonged use of the shallow and deep trench systems unless under constant and careful supervision. There were two recognized methods of disposal by incineration; in one, the latrine contents were carried in buckets or carts to incinerators at some distance from the latrines, and in the other, the excreta were disposed of immediately in an incinerator placed in or near the latrine.

After detailing the drawbacks and advantages of the first method, Major General McPherson discussed immediate incineration, stating that the Germans in 1902 made the first experiment in this mode but after an unfair trial abandoned the system. The McCall system, initiated by the American Army during the Cuban war, had been abandoned owing to the expense of fuel and the iron plates. McPherson said that he had had personal experience with the method before the war, both in India and Aldershot, and here the simple device of placing a layer of bhoosa or other dry material on the ground, making the men defecate on it and then setting fire to it, proved extraordinarily satisfactory.

In 1915, in France, and later in Saloniki, he had started a method of immediate incineration which was described in the *Journal of the Royal Army Medical Corps* in 1915. The essential principles were, first, the disposal of the urine by the men

themselves, either by emptying the receptacles into absorption pits, or by passing urine into a channel leading to the pit; secondly, the deposition of excreta into the incinerator, immediately after defecation, also by the men themselves. The incinerator could be of the open or closed variety and was frequently made out of a cresol drum, placed in or near the latrine. This method proved entirely satisfactory. A sergeant major in France maintained that it possessed the following advantages: a, cleanliness, freedom from flies, and comparatively little odor; b, definite area involved and practically no soiling of the ground; c, only one sanitary attendant required; d, it could be placed at a convenient distance from the men's living quarters, without fear of offense; e, it could be constructed of materials usually available in any camp by any intelligent noncommissioned officer, within three or four days of arrival at the permanent camping site.

Lieutenant General Sir John Goodwin, in discussing the subject, said that the method of immediate incineration was ideal and should be applied in boys' camps. The difficulties in future wars would be overcome if the civilian population was instructed in its use in peace time. The most serious criticism of the method was made by the well known sanitary authority, Lieutenant Colonel H. R. Kenwood, who thought that water carriage was always the best and the cheapest in the long run. He considered the dry earth system the next best; it produced no odor and no flies. Incineration was valuable and useful, he said, but he knew that in some instances, this method had had to be abandoned on account of the odor; probably the system of individual incineration would cause little or no nuisance in this respect. McPherson declared that there was little or no smell in the individual method and said that two small cresol drums made into incinerators had, in France, dealt daily with the excreta of two thousand men.

DRAMATIC SURGERY

The World War presented unusual opportunities for the display of surgical skill in the highest degree. The exigencies of circumstance often brought out or compelled originality, resulting in the devising of operative methods and the designing of mechanical means which would probably never have been thought of under normal conditions. A good deal of this impromptu surgery might aptly be termed dramatic, even spectacular.

At the opening of the eighty-seventh session of the Middlesex Hospital School, London, last October, Mr. Gordon Taylor delivered an address dealing with the dramatic side of surgery, in which he pointed out that success in abdominal surgery

during the war was largely determined by the military situation and by the varying possibilities of bringing together, at the earliest possible moment, the wounded man and the surgeon. For this purpose, airplanes were frequently used. It was also pointed out that surgery might have a dramatic aspect because of the surroundings in which it was practised. It was difficult to imagine a more dramatic environment for surgery than the dugout which Basil Hughes, of Bradford, built in a communication trench, when he was a regimental medical officer, to which the men could be brought within four or five minutes after being wounded.

The war, of course, only accentuated the romance and drama of surgery. This branch of the healing art has always had its romance. What could be more dramatic or romantic, for example, than discovering that mummies, embalmed and entombed thousands of years ago, had undergone when living surgical operations, such as trephining, which were thought to be modern.

The value of the progress made in surgery during the war lies in the use made of it in civil life. While there is, generally speaking, no occasion for urgent surgery in ordinary times, yet industrial surgery, not infrequently presents dramatic and romantic aspects. The lessons learned during the war, especially with regard to blood transfusion, should be applied to civil surgery to the great advantage of all concerned.

OPERATION IN GASTROENTERIC ULCER.

The controversy between surgeons and internists as to just when surgical intervention is indicated in gastroenteric ulcer has been revived by the publication by Finsterer in the *Deutsche Zeitschrift für Chirurgie*, during the latter part of 1920, of the end results in twenty-four cases of gastric and duodenal ulcer. In Finsterer's series there were eight deaths, four of which were attributed to the preoperative anemia. Hemorrhage seems to be the cardinal indication for operation; but, unfortunately, there is a considerable difference of opinion as to when to interfere in cases of bleeding, and as a consequence the patient is too often subjected to the dangers arising from the combination of doubt and delay.

Despite the fact that few surgeons are prepared to accept the dictum of the French school, led by Dieulafoy, that operation should be performed during the first bleeding, it must be admitted that the results of those who counsel delay, compared with the results of the advocates of operation during hemorrhage, are on a parity in so far as mortality is concerned. Those who argue for delay declare that the source of initial gastric bleeding is frequently

doubtful. It is averred that in a number of cases hemorrhage arises not from the ulcerated areas, as is generally supposed, but from the mucous membrane of the stomach, and that examination will reveal blood escaping between the epithelial cells.

As the initial hemorrhage is seldom responsible for death, operation during the progress of the first bleeding would appear to be distinctly contraindicated, but it does seem that the stage of quiescence immediately following the initial hemorrhage is the ideal time for operation. To wait until several hemorrhages have occurred, with resultant anemia, to say nothing of the dangers of perforation, increases the surgical hazard and has a decidedly grave influence on prognosis. The advisability of trusting to Nature does not hold good in ulcers of the gastric and duodenal type, and violates the surgical axiom governing secondary hemorrhage, namely, that even if bleeding has ceased, surgery is necessary to prevent its recurrence.

In view of the many failures attending the medical treatment of gastric and duodenal ulcers one almost feels warranted in saying that once diagnosis is established the condition comes purely within the province of the surgeon. The advantages of early operation are lessened chances of perforation, minimization of the dangers of hematemesis and the resultant anemia, and the good results necessarily accruing from earlier feeding. The recognition of malignancy in those few cases also makes early operation a worth while therapeutic procedure.

COST OF INDUSTRIAL MEDICAL SERVICE.

Definite figures regarding that heretofore dubious subject, the cost of industrial medical service, are given in a report published last May by the National Industrial Conference Board. The figures show that the average cost has practically doubled since 1916, but this is not considered excessive in view of the increased costs in every line of activity and also of the fact that many medical services have been greatly enlarged to include preventive work, care of the eyes and teeth, and so on, in place of merely attention to injuries.

According to the report, the average cost of health service in some 207 plants employing 764,827 workers is \$4.43 a person. By industries, the cost varied from \$1.84 a person in the tobacco industry to \$24.40 in mining. Of these amounts, it was found that 69.5 per cent. went to doctors, nurses and attendants, while the remainder was used for equipment and supplies and also for outside medical and hospital service. About one sixth of the plants with from five hundred to a thousand workers and one third of those having one thousand to two thousand employed a fulltime physician, while in nineteen plants with more than ten thousand employees there was an average of six fulltime physicians for each plant.

News Items.

Chinese Translation of U. S. Pharmacopœia.—Under the direction of the Philadelphia College of Pharmacy, the United States Pharmacopœia is being translated into the Chinese language.

Army Medical Supplies for Russia.—A resolution has been introduced in the House of Representatives, providing for the turning over to the American Relief Administration of all surplus medical supplies of the army valued at \$4,000,000.

The Mütter Lecture.—Prof. H. C. Jacobæus, of Stockholm, Sweden, delivered the Mütter Lecture for 1921, at the College of Physicians of Philadelphia, on Wednesday evening, November 2nd. His subject was, Internal Treatment of Ulcer of the Stomach.

Nobel Prize in Medicine.—Due to a shortage of funds, the Nobel Institute has decided not to award the Nobel Prize in Medicine this year. Among the more prominent names set in and considered were Sherrington of England, Magnus of Holland, and Henschen of Sweden.

New York Polyclinic Hospital to Be Returned to Trustees.—It is reported that the United States Government will return the New York Polyclinic Hospital to its former owners, early next year. The institution will be opened as a graduate medical school with greatly enlarged facilities.

Harvey Lecture.—The second lecture in the course will be delivered Saturday evening, November 26th, at the New York Academy of Medicine, by Dr. C. C. Little, research associate of the station for experimental evolution, Carnegie Institution of Washington. His subject will be The Relation of Genetics to Cancer Research.

Cancer in Great Britain.—Dr. Maxwell Williamson, of Edinburgh, is reported to have stated that cancer kills more than 42,000 persons every year in England and Wales, and the death rate from this disease is steadily increasing. He says that during the last twenty-three years the number of deaths in Edinburgh has increased from 267 in a year to 471.

Cancer Research Institute Appoints Consulting Board.—The Institute of Cancer Research (formerly the George Crocker Special Research Fund), of Columbia University, announces the appointment of a consulting board, the membership of which includes eminent biologists, chemists, physicists, statisticians, and surgeons who are interested in the experimental study of cancer. The surgical members of the board are Dr. William J. Mayo, of Rochester, Minn., and Dr. Eugene H. Pool and Dr. George H. Semken, of New York.

Medical Society of Virginia.—Dr. Edward C. S. Taliaferro, of Norfolk, was elected president of this society at the fifty-second annual meeting held in Lynchburg, October 18th to 21st, under the presidency of Dr. Alfred L. Gray, of Richmond. Other officers were elected as follows: Dr. John Staige Davis, of University, first vice-president; Dr. Clarence Porter Jones, of Newport News, second vice-president; Dr. J. Beverly DeShazo, of Ridgway, third vice-president; Dr. G. H. Winfrey, of Richmond, reelected secretary-treasurer.

Anniversary Meeting of the New York Academy of Medicine.—Dr. Henry S. Pritchett, director of the Carnegie Foundation for the advancement of Teaching, New York, delivered the anniversary discourse at the New York Academy of Medicine, Thursday evening, November 3rd, his subject being A Layman's View of Medical Progress.

American Academy of Otolaryngology and Ophthalmology.—At the annual meeting of this organization, held recently in Philadelphia, the following officers were elected: President, Dr. Walter R. Parker, of Detroit; vice-presidents, Dr. Ross Skillern, of Philadelphia; Dr. W. L. Benedict, of Rochester, Minn.; and Dr. John J. Shea, of Memphis, Tenn.; treasurer, Dr. S. S. Large, of Cleveland; secretary, Dr. Luther C. Peter, of Philadelphia; editor, Dr. Clarence Loeb, of Chicago. The next meeting will be held in Minneapolis.

Building Fund for Broad Street Hospital.—The Downtown Hospital Association, which is carrying on a campaign to collect \$1,000,000 for the purpose of building an addition to Broad Street Hospital, announced on Saturday, November 5th, that the total receipts on that date amounted to \$472,826. The association's aim is to double the capacity of this hospital, which is situated at 129 Broad Street. At present its facilities are wholly inadequate to meet the demands made upon it. At the time of the bomb disaster in Wall Street, it is said that this hospital cared for 179 cases in an hour.

American Surgeons Receive Honorary Fellowships in Irish College of Surgeons.—At the closing session of the American College of Surgeons, held in Philadelphia during the week of October 25th, honorary fellowships of the Royal College of Surgeons of Ireland were conferred upon the following American surgeons: Dr. George E. Brewer, New York; Dr. George W. Crile, Cleveland; Dr. John M. T. Finney, Baltimore; Dr. Albert J. Ochsner, Chicago; Dr. Charles H. Mayo and Dr. William J. Mayo, Rochester, Minn.; Dr. John B. Deaver, Dr. Richard M. Harte and Dr. W. W. Keen, Philadelphia. The fellowships were conferred by Sir Harold J. Stiles, Sir William Taylor and Sir Robert H. Y. Woods, who made the trip from Dublin especially for this purpose.

Personal.—Dr. L. Winfield Kohn announces the removal of his office to 427 Park Avenue, New York.

Dr. Gilbert T. Smith, formerly assistant superintendent of the South Dakota Hospital for the Insane, at Yankton, was appointed last April chief surgeon of the S. S. Mount Carroll, of the United American Lines, Inc. Dr. Smith has been connected with prominent state hospitals for over twenty years.

Dr. Robert Tait McKenzie, professor of physiology, therapeutics and physical education, University of Pennsylvania, Philadelphia, received the honorary degree of Doctor of Laws at the centennial celebration of McGill University, Montreal.

Dr. Harvey Cushing, professor of surgery at Harvard Medical School, was elected president of the American College of Surgeons, at the annual meeting held in Philadelphia during the week of October 25th.

Joint Meeting of Electrotherapeutic Associations.—The American Electrotherapeutic Association and the New York Electrotherapeutic Society are arranging a joint midwinter clinical meeting to be held on December 29th and 30th, at the United States Public Health Service Hospital No. 61, at Fox Hills, Staten Island, New York. All medical men are invited to attend but admission will be by card only. The program committee is composed of Dr. William Benham Snow, Dr. Byron Sprague Price, Dr. Victor Cox Pedersen, Dr. A. B. Hirsh, Dr. Richard Kovacs, and Major Samson. Cards of admission can be obtained from the registrar, Dr. Richard Kovacs, 223 East Sixty-eighth Street, New York.

Died.

ALRICH.—In Germantown, Pa., on Thursday, October 27th, Dr. William Marshall Alrich, aged fifty-eight years.

ANDREWS.—In Philadelphia, Pa., on Wednesday, November 2nd, Dr. James Campbell Andrews, aged eighty-four years.

BARCLAY.—In Chicago, Ill., on Tuesday, October 25th, Dr. William A. Barclay, aged sixty-five years.

BARNES.—In Hamburg, N. Y., on Monday, October 17th, Dr. F. Granville Barnes, aged sixty-six years.

BERGEN.—In Highland Park, Ill., on Monday, October 17th, Dr. Lloyd M. Bergen, aged fifty-six years.

BLANKENMEYER.—In Philadelphia, Pa., on Saturday, October 22nd, Dr. Henry John Blankenmeyer, of Gabriels, N. Y., aged forty-two years.

BOND.—In Dillon, Mont., on Sunday, October 16th, Dr. Harry A. Bond, aged sixty-two years.

BOSWELL.—In Mounds, Ill., on Sunday, October 23rd, Dr. Charles J. Boswell, aged forty-five years.

BURT.—In Atlanta, Ga., on Sunday, October 16th, Dr. William H. Burt, aged sixty-three years.

CARNES.—In Kosciusko, Miss., on Tuesday, October 18th, Dr. Charles F. Carnes, aged sixty-six years.

CHAPEL.—In Williamsport, Pa., on Sunday, October 16th, Dr. Victor P. Chaapel, aged fifty-seven years.

CHISOLM.—In Niagara Falls, N. Y., on Thursday, October 27th, Dr. Henry Clay Chisolm, of Huntingdon, Pa., aged sixty-two years.

DAVIDSON.—In Richmond, Tenn., on Wednesday, October 19th, Dr. Elijah Alvis Davidson, aged seventy-six years.

DE LACY.—In Crestview, Fla., on Thursday, October 13th, Dr. William H. DeLacy, aged forty-three years.

DEYO.—In Brooklyn, N. Y., on Thursday, October 27th, Dr. Jonathan Titus Deyo, aged seventy-five years.

DOUGLASS.—In Riverside, Cal., on Saturday, October 29th, Dr. William C. Douglass, of Ithaca, N. Y., aged fifty-eight years.

GIBBS.—In New York, on Friday, October 28th, Dr. John Wilson Gibbs, aged seventy-five years.

GRAVES.—In Juno, Tenn., on Friday, October 7th, Dr. John Franklin Graves, aged forty-two years.

HENRY.—In Northville, Mich., on Wednesday, October 26th, Dr. Thomas B. Henry, aged forty-six years.

HERSHEY.—In Lancaster, Pa., on Sunday, October 23rd, Dr. Emanuel R. Hershey, aged seventy-four years.

IRVINE.—In Washington, D. C., on Tuesday, November 1st, Dr. Robert T. Irvine, of Ossining, N. Y., aged sixty-three years.

JONES.—In Gadsden, Ala., on Thursday, October 20th, Dr. Eli Spear Jones.

JONES.—In Crystal Springs, Miss., on Monday, October 24th, Dr. Robert E. Jones, aged seventy-eight years.

LEVY.—In Richmond, Va., on Wednesday, October 19th, Dr. Henry Hyman Levy, aged seventy years.

MATHEWS.—In Philadelphia, Pa., on Saturday, October 29th, Dr. Franklin Mathews, aged seventy-three years.

STEPHEN SMITH, M. D.,
of New York.

Perhaps the most notable feature of the Health Fortnight program, with which the American Public Health Association is celebrating the completion of its first half century of existence, was the banquet given on the night of Wednesday, November 16th, at the Hotel Astor, in honor of Dr. Stephen Smith, the founder of the association. It was a fitting tribute to this Grand Old Man of the medical fraternity who, in 1871, launched what has grown to be the chief sanitary organization of America. The event was all the more notable because Dr. Smith himself was able not only to attend but also to deliver an address in which he touched upon the progress of public health work in New York and the nation at large during the past fifty years.

It is hardly necessary, in a medical periodical, to introduce Dr. Stephen Smith. He is not only one of the shining lights of New York's medical history, but also one of the most noteworthy figures in the nation's gallery of medical genius. His achievements and his record deserve unstinted praise, but interesting and remarkable as these are, the man himself is even more interesting, for he is in many respects one of the most extraordinary men in the world. Although he is now on the verge of ninety-nine years of age—his ninety-ninth birthday comes next February 19th—he is still energetically active and appears to be in such good physical trim that he is likely to be with us for several years more. Today, at ninety-eight, he walks with the elasticity and erectness of buoyant youth. There is no stoop to his shoulders, no shuffle to his step. Seeing his

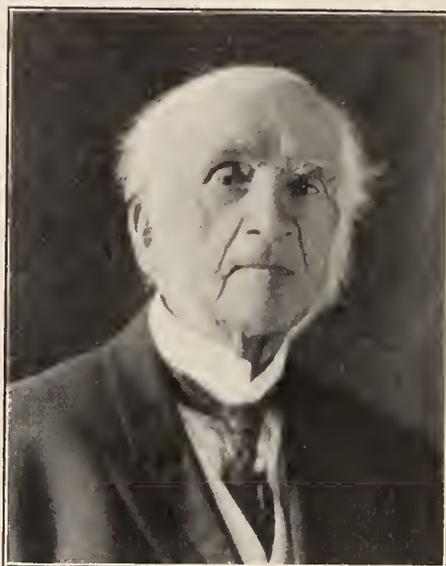
slight, trim, but broad shouldered figure, which is just above medium height, marching along the street—and marching is the word—one would never guess him to be a man near the hundred mark. One would put him down for middle age at best. Nor does his face betray his almost five score years. The deep set wrinkles that usually furrow the features of a person of extreme old age are missing. There is even a slight glow of pink to his cheeks and his keen blue eyes are bright and clear. He can still read a newspaper without the aid of spectacles. To be sure, he has snow white hair, but many men of sixty or even younger have that, though most of them have not the comfortable supply of it that Dr. Smith has.

Needless to say, Dr. Smith's mind is on a par with his body. There are no marks of senility about him; he is in no sense an old dodderer, but an alert brain-worker and student, still doing his share in the world's work. His is a very green old age and not the traditional sere and yellow leaf. He no longer

practises his profession, but that does not mean that he has resigned himself to a life of doting idleness. He spends three to five hours a day revising old medical brochures and writing his autobiography, in which he expects to set forth his views on how to live long and be healthy, happy and useful. In doing this work he is his own stenographer and operates his typewriter with the nimbleness of youth.

He would not be happy if he were not busy at some sort of work, he declares. He says that if he were doing nothing he would run to seed and soon be in his grave. Work, he contends, is the second chief essential in the attainment of patriarchal years. "Your brain cells," he points out, "thrive on stimulation. They must be kept busy, and if your work fails to keep them busy, try something else that will. Anything. Fall in love, or develop a hobby. Read the daily papers, especially the exciting events, such as prize fights, ball contests, football games, murder mysteries and even divorces!"

But the first essential to the attainment of venerable years, Dr. Smith holds, is proper food. His doctrine is that "a man is as old as he eats," and he is emphatic in declaring that neither fresh air nor physical culture can prolong life to any considerable extent if one persists in eating the wrong foods, or too much food of any kind. Here, by the way, is a paradox in connection with Dr. Smith's seniority. He has reached the age of ninety-eight because during the first half of his life he was practically an invalid, with such a severe case of dyspepsia and colitis that he had to take the best of care of his digestive organs. "The dyspepsia of my earlier years forced me to a meagre diet of simple foods," he explained, "and as a result I saved my stomach and have the



DR. STEPHEN SMITH

use of it now. I took care of my stomach during the first fifty years of my life and now it is taking care of me. However, I have not abused my stomach at any time. The habit of taking care of it has clung to me. It was during a visit to Paris, as a delegate to the International Sanitary Conference, that I learned to drink wine, with the result that I have been well ever since. I dreaded to go to that conference, because I knew there would be a long round of heavy banquets. At the second of these functions I sat next to a famous French physician, whom I told about my unfortunate handicap. He advised me to drink wine between the courses, saying it would digest the food I had eaten before the next course was served. I followed his advice and did not experience any further discomfort."

Walking has always been one of Dr. Smith's favorite forms of physical exercise. Up to about two years ago it was his habit to walk about eight miles a day, but since then he has modified his walk-

ing program somewhat. He goes out one, two or three times a day for short walks. "Of course," he explains, "I remain indoors when the weather is inclement, for a man of my age must be careful to avoid pneumonia."

Naturally, Dr. Smith had looked forward with eager interest to this semicentennial of the American Public Health Association. Not only was he its first president but was twice elected to succeed himself and retired from the executive chair of his own volition. To him fell the arduous task of organizing the association and making it effective, and guiding its early steps toward the goal of success. The first step that led to the organization of the association was in 1864 when Dr. Smith was appointed a member of the Council of Hygiene of New York City. Sanitary conditions in the city were deplorable at that time, to say the least. Dr. Smith supervised the investigations of the hygienic council and the report which that body submitted in 1865 created a sensation. The outgrowth of this was the creation of the Metropolitan Board of Health, the first health board in the United States, by an act of the New York Legislature in the spring of 1866. The law, based upon the sanitary survey which Dr. Smith and thirty-two assistant physicians had made, embodied all the best features of the French and English health laws. Dr. Smith became the first commissioner of the city's new board of health and remained in that position until 1875. During that period the death rate was reduced from thirty-eight to twelve, the city soon became one of the healthiest in the world, and other large cities throughout the country took similar steps.

Dr. Smith has not only the New York City Board of Health to his credit, but also the New York State and national boards. He drafted the bill for a national board of health which Congress passed in 1878 and during his régime as city health commissioner drafted the bill establishing a State health board. When the federal health bill was passed President Hayes appointed Dr. Smith a member of the board and he served four years. It took years of agitation to get this bill through Congress, owing to the States Rights doctrine, and it was not until an epidemic of yellow fever began to ravage the South that favorable action was taken. The name of the National Board of Health was changed in 1881 to the Marine Hospital Service.

When several other cities, following the example set by New York, had established municipal health boards, Dr. Smith called a conference of the commissioners to form an association of national scope for the advancement of public sanitation and health. He aimed, in this way, to promote the movement in Congress for establishment of a federal health board and at the same time set in motion a great unofficial organization for the improvement of health standards. Thus the American Public Health Association came into existence, at first covering only a part of the United States but now covering not only all of this country but Canada, Mexico and Porto Rico.

Public sanitation has not been the sole direction in which Dr. Smith has devoted his time, skill and energy. In 1881 he was commissioner of the State Board of Charities for the first judicial district,

under appointment by Governor Cornell, who transferred him, in 1882, to the position of State Commissioner of Lunacy. His work for the insane was characterized by enlightened humanity and during his six years as head of the lunacy board he revolutionized the treatment of insane patients. His connection with the State Board of Charities, however, was resumed in later years and it was not until his ninety-fifth year that he resigned from the board, after seventy years of public service devoted to the improvement of health conditions in general and to the bettering of conditions in the care and treatment of the unfortunates of his city and State.

In 1868 he drafted the bill creating the Bureau of Vaccination, since which time there has been no epidemic of smallpox in this city. On his recommendation the first training school for nurses in a State hospital was established in Buffalo, in 1884, and he was early an advocate of State care of the dependent insane. In 1890, after defeats in two previous legislatures, the State Care Act, embodying his idea for removal of the insane from county poorhouses and asylums to State institutions, became a law. These are only a few of the many things this pioneer in American health legislation has done for the benefit of his fellow man.

Dr. Smith was born on a farm in Onondaga County, N. Y., and began studying medicine in high school. Later he entered Geneva Medical College and had as a classmate Elizabeth Blackwell, the first woman medical student in America. He has been a lifelong suffragist and exponent of the upward movement of woman. After his Geneva studies he spent two years at the hospital of the Sisters of Charity at Buffalo, N. Y., and then entered the College of Physicians and Surgeons in New York city, from which institution he was graduated in 1851. He was appointed an intern at Bellevue Hospital shortly after his graduation and in 1854 became a surgical and clinical teacher at Bellevue Hospital Medical College, continuing this work until 1891. He also was professor of anatomy in that institution from 1863 to 1870, and was the first to introduce antiseptics into Bellevue Hospital. The other surgeons would have nothing to do with antiseptics, but Lister, the discoverer, visited Dr. Smith's wards and complimented him on his work.

He has been a voluminous writer throughout his busy life. He began to write early in his career and has been a fertile contributor to the medical literature. From 1853 to 1860 he edited the *New York Journal of Medicine* and from 1860 to 1864 he edited the *American Medical Times*. He also was American correspondent for the London *Lancet* for several years. During the Civil War he wrote a handbook of surgical practice used in the army, and has written several other medical volumes. His last book, *The City That Was*, describes the unsanitary conditions of New York prior to the creation of the health board.

His has been an amazingly useful life and one of great happiness. There is only one person who can do it full justice, and that is Dr. Smith himself. His autobiography will be awaited with the keenest interest by all those who know of him and his wonderful career.

Book Reviews

DAYTON'S PRACTICE OF MEDICINE.

Practice of Medicine. A Manual for Students and Practitioners. By Hughes Dayton, M.D., New York. Fourth Revised Edition. Philadelphia and New York: Lea & Febiger, 1921. Pp. xi-326.

In this fourth edition, the author has continued the policy adopted in previous editions, of excluding consideration of the diseases of the pharynx, larynx and tonsils, in order to avoid curtailment of the most important subjects, such as tuberculosis, pneumonia and typhoid fever. As a result, the author has succeeded in presenting a very useful volume within an incredibly small space.

The entire volume has been thoroughly revised, the principal changes having been made necessary by advances in the knowledge of infections and the functional disturbances of the heart. It is fully up to date, especially in the matter of diagnosis and treatment, in which the author has embodied the generally accepted and conservative views of present day internists. As an aid to students and as a hasty reference work for the busy general practitioner, the book can be recommended unreservedly, as a safe and reliable guide.

VENEREAL DISEASES.

Veneral Diseases, Their Clinical Aspect and Treatment. With an Atlas of One Hundred and Six Color and Twenty-one Half Tone Illustrations. By J. E. R. McDONAGH, F. R. C. S., Surgeon, London Lock Hospital; Late Hunterian Professor, Royal College of Surgeons, etc. St. Louis: C. V. Mosby Company, 1920. Pp. 450.

This book of four hundred and fifty pages, all crowded with thought provoking matter, is truly a monumental work on the venereal diseases. The author is one of England's best known syphilographers, and this work represents a vast experience and his original views resulting from it. He calls a spade a spade and gives his reasons for doing so. That is the predominating feature of this work—its heterodox views on the causation, nature and therapy of syphilis. The Spirochæte pallidum is discussed at great length, not as the etiological factor but merely as the adult male form of the leucocytozoon syphilidis. The German syphilitic trinity—the spirochete, salvarsan and the Wassermann reaction, are opposed as having caused clinical diagnosis to take a back seat, in the matter of syphilis, with disastrous results. Whether or not his views on the trinity are correct, he undoubtedly stands on solid ground when he advocates greater attention to clinical diagnosis and less reliance on the diagnosis made in the laboratories.

The illustrations, many of them in color, are exceedingly well done, and illuminate the text in the fullest degree. The text matter is exhaustive in scope, yet written in a style that does not pall or weary the reader. He uses the letters C. F. T. for the Wassermann test, in which respect, it is to be hoped, all other writers will imitate him.

In the matter of therapy in syphilis, the author is quite orthodox, though it is to be expected that he

would depart from the usual routine methods. He places much faith in sulphur preparations (intra-mine) as adjuvants to the use of arsphenamine, which he employs in the usual way. He also employs colloidal iodine, on the theory that it breaks up the colloidal protein particles in the blood, thus adding to their receptive capacity for arsphenamine.

Chancroid and gonorrhœa are likewise treated extensively, but in the reviewer's opinion, not quite so successfully as the chapters on syphilis. American urologists, who are achieving such brilliant results in chronic gonococcal vesiculitis, through Belfield's operation of vasotomy, will read with surprise his statement that he has never seen any resulting benefit from it (page 306). He advocates the use of trimine as a method of aborting impending acute epididymitis; and both trimine and intramine are recommended for the prevention and removal of the fibrous tissue nodule in the epididymis after inflammation has occurred.

On the whole, the work is a most interesting and useful addition to the literature on the venereal diseases, and should be studied carefully by every medical practitioner who treats these ailments. It is probably within the truth to say that no book on venereal diseases that has appeared within the past decade, contains such a wealth of authoritative information of a progressive character. Both the author and his publishers deserve to be congratulated on having produced an excellent work.

SICK CHILDREN.

The Clinical Study and Treatment of Sick Children. By JOHN THOMSON, M. D., F. R. C. P. (Edin.), Consulting Physician to the Royal Edinburgh Hospital for Sick Children; Formerly Clinical Lecturer on the Diseases of Children, University of Edinburgh. Third Edition, Rewritten and Greatly Enlarged. With 249 Illustrations. Edinburgh and London: Oliver & Boyd, 1921. Pp. xxxii-877.

In the third edition of Thomson's book the entire work has been rewritten. We find therein a comprehensive review of the literature dealing with pediatrics for many years back. It is gratifying to note the scope and breadth of these culled findings. Continental as well as American authors are given due credit alongside those of his British coworkers. But the book offers more, for the author always finishes with the remarks taken from his own far-reaching experiences and his logical conclusions are worthy of consideration. Spasmophilia, formerly a little known condition, is given an independent chapter. Food disorders and infant feeding are well presented and in a manner easy to grasp by the practitioner.

Important chapters from the point of view of presentation and practical importance are those on rickets, celiac disease, and diseases of the liver. The part dealing with skin diseases has been amplified. An intensely interesting presentation of pyrexia is given. Modern psychologists will be pleased to see the functional neurosis given so much intelligent consideration. The neurological section devotes

much space to encephalitis lethargica and poliomyelitis. The book is an important contribution to pediatrics. It should surely find favor among American workers in this field of medicine. The publishers have spared no effort to produce an admirable piece of bookmaking.

A PRIMER IN UROLOGY.

Urologie des praktischen Arztes. Von Hofrat Dr. FELIX SCHLAGINTWEIT, Chirurg für Harnkrankheiten in München. Mit Thirty-nine Abbildungen. München: J. F. Lehmanns, 1921. Pp. 135.

This little paper bound volume on urology treats the diseases of the urinary tract rather fully though in a brief space, from the viewpoint of the general practitioner. In his foreword the distinguished author explains the object in view, namely, to provide a primer in urology, not a textbook, for practitioners; his view is that every physician in general practice ought to be able to diagnose with a reasonable degree of accuracy, the various diseases of the kidney, ureter, bladder and urethra, with which he is confronted in his daily practice. The text matter is written in straightforward, simple style, condensed and concentrated for the special needs of the busy practitioner, with little time to wade through thick textbooks. He concludes by enunciating five points, which, he hopes, will be taken up by students and practitioners, and thus increase the efficiency of their urological work. We do not know of any book like this in the English language, but we feel there is a distinct need for one like it.

PSYCHIC ACTIVITY.

In Search of the Soul and the Mechanism of Thought, Emotion, and Conduct. A Treatise in Two Volumes Containing a Brief but Comprehensive History of the Philosophical Speculations and Scientific Researches from Ancient Times to the Present Day, as Well as an Original Attempt to Account for the Mind and Character of Man and Establish the Principles of a Science of Ethology. Volume I: The History of Philosophy and Science from Ancient Times to the Present Day. Volume II: The Origin of the Mental Capacities and Dispositions of Man and Their Normal, Abnormal, and Supernormal Manifestations. By BERNARD HOLLANDER, M. D., Author of *Mental Functions of the Brain, Mental Symptoms of Brain Disease, First Signs of Insanity*, etc. London: Kegan Paul, Trench, Trubner & Co., Ltd.; New York: E. P. Dutton & Co., 1921. Volume I, pp. x-516; Volume II, pp. vii-361.

An adequate review of a book of such dimensions as this is impossible. There is much in its detail which, like its general purpose and the attitude in which this is carried out, make of it an exceptionally valuable work. There are also many things in the individual parts of the book which are worthy of critical disagreement, or at least of further question. It is part of the writer's attitude that this should indeed be so for he has no hesitancy in stating that he presents no absolutely final views. He desires to set forth the truth as he sees it with an open mind himself giving credit to those who have forwarded a true science of the psychic life in the union of physiology and psychology as means of study. Then he would leave every part of the study free for further investigation, reversal of opinion, or such enlargement as would admit any new discovery of fact in whatever sphere. He approaches his

work with a fertile exercise of thought, utilizing facts of his own observation and experience together with those garnered from the work of others. He has a comprehension broad enough to grasp the genetic and functional relationship of mind or psychic activity to the body, chiefly to its special organ the brain.

He has covered an enormous field of review historically in passing over the speculations and theories of ancient man in regard to psychic activity, the existence and activity of the "soul." He has traced these through the early science of the Greeks, passing as this did on through their philosophical schools. He has followed the deeper merging of the scientific thought into the more mystic speculation of the Middle Ages and the effect this had of obscuring actual observation until near the nineteenth century. There is too much brevity of statement naturally in such large scheme for a complete picture of the various theories of mankind and their full setting in the development of thought. Yet even where this occurs there is ample suggestion for further study and at the same time a valuable condensed review of all this important history. Particular space is given to Gall as a neglected and still more misunderstood pioneer in the grounding of a true science of the brain as a physiological basis for the psychological study which must inevitably accompany it.

This full treatment of Gall's work and his position among his contemporaries and followers, those who opposed him and those who have substantiated and further developed his work, leads Hollander on to the second volume where he makes a more complete statement of his own position. With due regard to the intensive work done on special areas of the brain and the progress made in exact knowledge of these, he utters words of caution against a slavish acceptance of the findings as final and absolute. Too often have they been superseded by further research to believe that they represent the last word of truth. The brain can not be comprehended. The actual meaning of its localizations cannot be realized without the comprehension of the functioning mind force behind the patterned machinery of the brain. While he calls attention to the too little understood mechanism of the cerebellum and its service at the bidding of the emotions, his statement has not been sufficiently clear as to what he means here in regard to the localizations of the emotions within it.

His emphasis upon psychology as the background of brain physiology reveals the breadth of his viewpoint. His vital conception of the functional relation of mind and body which makes up the whole story leads him to admit practically that in the search for soul we come upon the fact that acting man is soul, not "has a soul." He is not willing, however, to exclude a possibility of something higher than the mere nature of man, a "supernormal," some of the apparent evidences of which he is not ready to explain on only human terms. He accepts a psychology of the unconscious, preferring usually to speak of the "subconscious," but he does not accept this quite fully enough to find it the source of all psychic projection.

There is this lack of completeness in his psychology of psychic activity. He does not seem to grasp

such activity in that complete synthetic unity by which Freud defines the affective life as the outspreading of two fundamental instincts. So Hollander still continues in the naming of many instincts, tries to grade the affective life into instinct, impulse, propensity and must needs have another word also for the science of character and man's behavior, the borrowed term ethology. We find this lack of a unifying conception in his discussion of mental disturbances where he follows the old unenlightening descriptive paths. He cannot understand Freud's method of treatment and speaks of the sex root of difficulties as something apart and therefore finds it overexaggerated instead of understanding it as the synthetic origin of psychic activity in the reproductive.

There are nevertheless many ideas in the book, which are most stimulating both in the relation of their content to practical psychology and its social applications and in the method of presenting such ideas. His discussion of criminology from his point of view of the union of psychology and physiology is well worked out and striking in its challenge to society. There is in many places a call to independent thought both in research and in the acceptance or rejection of what has gone before. The book contains much valuable historical matter. It is full of vital interest in many directions.

FAMILY PSYCHOLOGY IN MODERN FICTION.

The Narrow House. By EVELYN SCOTT, Author of *Precipitations*. New York: Boni & Liveright, 1921. Pp. 221.

Of the realists transplanted from England, as yet the most realistic. Realistic in the sense of Russian gloom. We hope it is not real life since even at its worst we could not bear to have the misery piled on so thick.

The inevitable family complex as a starting point. It has been well treated. It is not obtrusive. Not till you lay the book down do you realize that this is the factor that has wrought the ruin. Father, mother, son and daughter crammed into one house, stultified by the crampedness of it, stagnating. In the remote past there has been difficulty between father and mother. The house is begloomed by the shadow of the mother's forgivingness. The son, a promising young scientist, has married a pretty child of bourgeois parents. She ruins her husband's possibilities, his creative work, by her craving to be the centre of attention. She, her ills, and her two children also flock beneath his parent's roof. The daughter of the family, a love starved business woman, unattractive, facing an empty life, fills out the neurotic complement. Every interest in the book centres inward, within the house's four walls. Small wonder that the festering becomes more and more intense as the story proceeds. There is no beauty, no prospect, simply stark destruction. Each character at some time or other has made the struggle to escape, but has been sucked back in again relentlessly. A truly wonderful chamber of horrors in this book; too dreadful to be read subjectively but fascinating for the objective eye of the student of psychology.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE MOUNTBANK. By WILLIAM J. LOCKE. New York and London: John Lane Company, 1921. Pp. 320.

GOD'S ANOINTED. By MARY KATHERINE MAULE. New York: The Century Company, 1921. Pp. 357.

THE PSYCHOLOGY OF FUNCTIONAL NEUROSES. By H. L. HOLLINGWORTH. New York and London: D. Appleton & Co., 1920. Pp. xiii-259.

A MUMMER'S TALE. By ANATOLE FRANCE. A Translation by Charles E. Roche. London and New York: John Lane Company, 1921. Pp. 240.

HISTORY OF THE PENNSYLVANIA HOSPITAL UNIT (Base Hospital No. 10, U. S. A.) IN THE GREAT WAR. New York: Paul B. Hoeber, 1921. Pp. 253.

THE ANALYSIS OF MIND. By BERTRAND RUSSELL, F. R. S. London: George Allen & Unwin, Ltd. New York: The Macmillan Company, 1921. Pp. 310.

INFANT MORTALITY IN NEW YORK CITY. By ERNEST CHRISTOPHER MEYER, Ph. D. New York: The Rockefeller Foundation International Health Board, 1921. Pp. xiv-135.

OPERATIVE SURGERY. By J. SHELTON HORSLEY, M. D., F. A. C. S. With 613 Original Illustrations. Illustrated by Miss Helen Lorraine. St. Louis: C. V. Mosby Company, 1921. Pp. 721.

FOOD PRODUCTS, THEIR SOURCE, CHEMISTRY, AND USE. By E. H. S. BAILEY, Ph. D. Second Revised Edition. With Ninety-two Illustrations. Philadelphia: P. Blakiston's Son & Co., 1921. Pp. xvi-551.

SPIRITUALISM AMONG CIVILIZED AND SAVAGE RACES. A Study in Anthropology. By EDWARD LAWRENCE, F. R. A. I. London: A. & C. Black, Ltd.; New York: The Macmillan Company, 1921. Pp. xiii-112.

THE PSYCHOLOGY OF THOUGHT AND FEELING. A Conservative Interpretation of Results in Modern Psychology. By CHARLES PLATT, B. S., Ph. D., M. D., F. C. S. (Lond). New York: Dodd, Mead & Co., 1921. Pp. x-920.

THE TREND OF THE RACE. A Study of Present Tendencies in the Biological Development of Civilized Mankind. By SAMUEL J. HOLMES, Ph. D., Professor of Zoology in the University of California. New York: Harcourt, Brace & Co., 1921. Pp. v-396.

THE PRACTICAL MEDICINE SERIES. Comprising Eight Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Charles L. Mix, M. D. Volume I: General Medicine. Edited by FRANK BILLINGS, M. S., M. D., and BURRELL O. RALSTON, A. B., M. D. Series 1921. Chicago: The Year Book Publishers. Pp. 630.

LIFE AND TIMES OF AMBROISE PARÉ (1510-1590). With a New Translation of His Apology and an Account of His Journeys in Divers Places. By FRANCIS R. PACKARD, M. D. With Twenty-two Text Illustrations, Twenty-seven Full Page Plates, and Two Folded Maps of Paris of the Sixteenth and Seventeenth Centuries. New York: Paul B. Hoeber, 1921. Pp. xii-297.

THE OXFORD MEDICINE. By Various Authors. Edited by HENRY A. CHRISTIAN, A. M., M. D., Hersey Professor of the Theory and Practice of Physic, Harvard University; Physician-in-Chief to the Peter Bent Brigham Hospital, Boston, Mass.; and Sir JAMES MACKENZIE, M. D., F. R. C. P., LL. D., F. R. S., Consulting Physician to the London Hospital, and Director of the Clinical Institute, St. Andrew's, Scotland. In Six Volumes. Illustrated. Volume IV: Disease of Lymphatic Tissue, Metabolism, Locomotory Apparatus, Industrial Disease and Infectious Diseases. New York, London, Toronto, Melbourne, Bombay: Oxford University Press, 1921. Pp. xv-938.

Practical Therapeutics

THE INJECTION TREATMENT OF BOILS.

BY DAVID LAZARUS, M. D.,
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Service of Dr. Walscheid, West Side Hospital.

The treatment described in this paper is not to be taken as a panacea for all boils, but rather as an aid to the more rapid or abortive treatment, instead of the old time surgery with its troublesome and tedious dressings.

Pathologically considered, a boil is an infiltration of the epidermis with accompanying degeneration, breaking down of the infected area, and a tendency toward abscess formation, surrounded by a growth of protective membrane limiting its extent. Several of these boils in a conglomerate state, with individual sinuses, constitute what is known as a carbuncle, which differs from a boil by its greater extent of inflammatory reaction and depth of infiltration.

Boils are usually due to staphylococcus, streptococcus, or colon bacillus infections, which are always more or less present upon the skin surface of man. With new activity brought about by irritation they penetrate the epidermis. This irritation or active congestion may be due to the following causes: skin excretion of uric acid; glycosuria; scratching of the parts, as in scabies; excessive perspiration; some foreign matter, such as the use of depilatories, rouge or powders; a lowered resistance of the general health, due to dissipation, mental worry or overwork; pyorrhœa alveolaris or other focal infection; and finally it may be caused by the internal secretory glands disturbing basal metabolism.

In accordance with the etiology, boils may be divided into two classes, namely, local and general; that is, those in which the exciting factor is distinctly external and local, and those that can be traced as arising from the general systemic condition. This latter class can be subsequently divided into two forms, those from known constitutional diseases and those apparently idiopathic. The known causes are well illustrated in such diseases as diabetes, in which the patients, although scrupulously clean, contract furunculosis in their state of lowered resistance; or in those cases whereby direct metabolic influences work, as in the pregnant woman or the menstruating woman who present furunculosis. In the apparently idiopathic causes we have been able to trace many cases to a dissociation and dysfunction of the internal secretory glands to such an extent as to disturb the nutritional, neurotic, psychic and other natural factors of the human economy, thereby lowering the resistance of the individual.

In the etiology of this condition it will be also of interest to bear in mind the condition known as staphylococcemia, in which no perceptible lesion can be found but only the presence of the staphylococcus circulating in the blood often setting up states of temperature as high as 103° F., or causing idiopathically abscesses in the ear or other parts of the

body, such as colitis, stye, and furunculosis. Furunculosis occurs most commonly in middle life, although no age is exempt, and most frequently appears in the spring and fall.

The faulty metabolic change is frequently recognized by a small papule, pruritic in character, manifesting itself in a swelling, with local tenderness and a hyperemic appearance, terminating in pus formation and the well known actively congested circumscribed indurated core.

TREATMENT.

Taking the above named etiological factors into consideration the treatment of this condition necessarily resolves itself into general and local applications. In the general care of the patient any and all body derangements must be taken care of. Constipation must be overcome not by physics and cathartics alone, but with high colonic irrigations of oxgall and hydrogen peroxide with turpentine and asafetida. A good mixture consists of two quarts of warm water to which is added a tablespoonful of oxgall, two teaspoonfuls of wine of asafetida, four tablespoonfuls of peroxide and two tablespoonfuls of glycerin. Beside this, anemic conditions are to be overcome with proper doses of iron or arsenic. Autogenous vaccines often aid in the cure of furunculosis, as does also the violet ray or the x ray if given in proper and regulated doses. Yeast has been advocated by some either alone or in combination with calcium sulphide. We have had varying results with this, however, but have achieved good results in the administration of pancreas extract two grains, suprarenal one grain, thyroid extract half a grain, calcium chloride five grains, given in capsule form; these doses must be varied often in accordance with therapeutic indications. With this treatment often is given the intravenous injection of sodium cacodylate, five to ten grains, and repeated in two weeks. Daily baths and careful attention to hygiene must not be lost sight of. Light calisthenic exercises help to build up and retain the body resistance of the individual.

In the local treatment of a boil it must be borne in mind that squeezing it only tends to spread the infection and to break down Nature's protective membrane. Cropper (1) advocates the early incision of the central area of the boil by means of a cataract knife, done under a spray of ethyl chloride, but Skillern (2) is opposed to this, believing that early incision is meddlesome surgery. With this method of injecting the boil the pain is more quickly relieved and the condition cured without the long drawn out affair of surgical interference and the surgical dressings which come after, each accompanied by severe pain.

Since writing the preliminary report upon this method I have discarded the use of iodine in the injection and employ simply five per cent. camphor in oil, a mixture which is less irritating and at the same time acts as an antiseptic, astringent and mild counterirritant, thereby bringing about greater hype-

remia and increased leucocytosis which aid in an earlier absorption of the infiltrated matter. After the furuncle is aseptically injected it is dressed with an ointment made as follows:

Acid phenol.....	m. x
Ext. ergot.....	gr. v
Resorcin.....	gr. x
Zinc oxide.....	dr. i
Lanolin.....	oz. i

Covering this ointment a small sterile dressing is applied and held in place with a bandage instead of adhesive strappings which have a tendency to produce irritation of the skin and perhaps favor the advent of other furuncles. This dressing is not disturbed for at least two days when the boil is redressed and reinjected if found necessary and the salve again applied. Usually, however, at the termination of this second dressing no further injections are necessary except that the use of the ointment is continued until the entire boil has disappeared. Should a core be present at any time of the treatment it will very easily be removed by this method.

In the preparation of this paper I wish to thank Dr. Walscheid for the use of his clinic, as also Dr. Gross and Dr. Rusin for their kind aid in the treatment of cases.

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2. SKILLERN: *Pennsylvania Medical Journal*, July, 1913.
327 CENTRAL PARK WEST.

A NEW METHOD FOR FEEDING THE SICK.*

BY ALFRED KAHN, M. D.,
New York.

Doubtless most physicians who have made more than a casual visit to the sick have observed that where there is an absence of desire to take food it seems to be an act on the part of Nature to conserve the individual. It may be that it is Nature's desire to keep the blood specialized in the formation of antitoxin and other protective means to meet an invasion of a foreign infection. If food is allowed to enter the stomach and the blood is compelled to absorb this food from the alimentary tract, this specialization on the part of the blood is lost, because the blood cannot concentrate upon the main issue in hand—the invasion of the disease. This is perhaps the reason why, especially in infectious diseases, a patient becomes nauseated and has no appetite for food. In some instances, this repugnance to taking food, and even nausea and the vomiting of all food, may last for days. Then again, there are patients who through obstruction or paralysis, or for some other reason, are not able to take food into the stomach, and there are patients who cannot even keep water in the stomach. Naturally over a period of days, such a state of affairs continuing, the patient becomes greatly weakened, even to such a point that life itself may be lost. The attendant is at his

wit's end. He attempts to feed per rectum. The patient is becoming weaker. He tries a Murphy drip. Upon withdrawal of the tube from the rectum, the rectal solution is expelled. What can be done?

The physician has one procedure—the procedure which has never failed—the patient can be fed through the blood stream. After birth, the baby suckles its food. What in reality takes place, is that the mother ingests the food, metabolizes it, and excretes it with the aid of the mammary glands and the suckling of the baby; but before the baby can actually use the milk digested, it must be broken up and absorbed into his blood stream. But the process is even shorter in embryo. It is not necessary for the baby to go through his stage of suckling and digestion. In embryo, he receives his food from the mother into his blood stream, and my method is a reversion to this stage in the life of the animal.

TECHNIC.

I use an instrument (Fig. 1) which consists of a tube three quarters of an inch long. It tapers at one end, so that it can readily enter the lumen of one of the large veins at the elbow. The other larger end is of a diameter adaptable to a record syringe. It is also adaptable to a plug, as shown in (Fig. 1), so that it can be stoppered at will. Just below the centre surrounding the outer surface, the tube is grooved for the reception of a silk ligature. The patient's elbow is cleaned surgically. An incision an inch long is then made down to one of the veins on the inner side of the elbow joint. (This appearance is exaggerated in (Fig. 2) in order to bring out detail.) It is opened and the little food button just described is inserted. A ligature is placed around the vessel, so that when it is tied, it fits snugly the groove on the instrument, which was made for its reception. A ligature is then placed into the skin wound above and below. The outer end of the

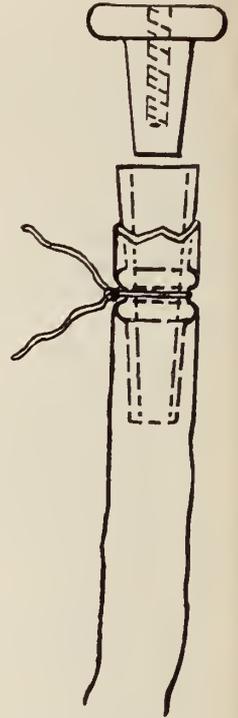


FIG. 1.—Full view of instrument.

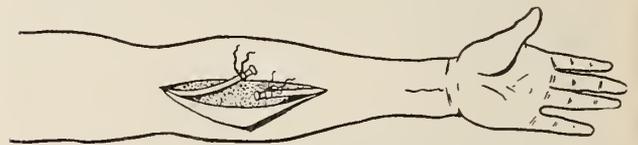


FIG. 2.—Illustrates technic and shows how instrument is tied into the vein.

food button remains above the skin surface. The surgeon can now withdraw a few cubic centimetres of blood from any individual who is willing to act as a donor. The stopper is removed from the food button and the blood is injected into the patient, after which the stopper is again placed in its open-

*This instrument was presented at a meeting before the Otological Section of the New York Academy of Medicine, May 14, 1920, during the reading of a paper entitled *The Logical Cause, Pathology, and Treatment of Brain Lesions*. An Experimented Paper.

ing in the button. Then, the feeding being finished, the elbow wound is bandaged, the button remaining in the vein. When it is desired to give another feeding, the stopper is removed from the food button ligated in the vein, when a further injection of blood takes place. I might add that any relative or friend would be willing from time to time to give a few cubic centimetres of blood to an invalid patient. The blood given by the donor is much less than a transfusion, being perhaps but little more than that taken when a Wassermann reaction is made. In a healthy individual twenty, forty, or one hundred cubic centimetres of blood are readily renewed in a few hours. Should it be desirable to inject saline solution, this can be given in the same way. Simply remove the plug and make the injection through the food button. The button can be allowed to remain in the vein for days, and the patient's strength kept up until the stomach is ready to take nourishment and water.

The food button is made of silver and in various sizes to fit the lumen of all vessels. I prefer to use the button in relation to a special syringe and apparatus which I have had made for the purpose. However, a record syringe or a salvarsan outfit will answer equally well as a means of transferring the blood to the patient. Where only a few cubic centimetres of blood are injected the elaborate transfusion blood tests are not necessary. Twenty or forty cubic centimetres might be drawn from an individual at one feeding and a similar amount from another friend at the next feeding. The patient is always ready to receive, and he should be given an injection as many times during the day or week as the physician considers advisable. I might add that intravenous medication, if properly prepared, can also be given through the food button.

48 EAST FORTY-NINTH STREET.

Diet in the Treatment of Chronic Arthritis.—

Ralph Pemberton (*American Journal of the Medical Sciences*, April, 1921) says that in a preponderating number of cases of chronic arthritis, if the patients are placed upon a sharply reduced intake of food, or on a starvation basis, they will show within a period of one to four days a betterment in their subjective feelings, lessened tension of the soft tissue, and an added freedom of movement. The improvement may follow upon intercurrent surgical operations of many kinds and examples of such improvement, together with criteria as to the early evidences of clinical betterment, are detailed in the references already given. The improvement under sharp dietary restrictions may and generally will be seen, even in the presence of causative foci of infection, because the principle under which it acts is that of catering to a weakened function, probably an oxidative function, dislocated in most cases by some inflammatory process usually in the form of focal infection. Following upon a chronic focus of infection, however, there may be a more or less permanent dislocation of normal physiology, as illustrated by the lowered sugar tolerance, such that removal of the focus is not sufficient to restore it, and

it is particularly for this reason that disappointing results so frequently follow the removal of definite infectious foci. Notwithstanding the possibility, however, of demonstrating the benefits from a reduced caloric intake, even in the presence of focal infection, therapy based upon this should never be attempted in the presence of such removable infection. It would be obviously unsound to attempt treatment by adjusting conditions to the limitations of a weakened function if the cause of that weakened function can be removed. There are occasionally contraindications to the removal of foci which make such action justifiable, but the chief field of use for dietetic therapy in active arthritis is that in which focal infection definitely cannot be demonstrated, or, better, has been definitely removed without further clinical improvement.

Treatment of Incoercible Vomiting of Pregnancy.—J. Pescher (*Bulletin de l'Académie de médecine*, July 12, 1921) calls attention to the diminution of respiratory vital capacity frequently present in patients suffering from gastric or intestinal disorders. The reduction of breathing capacity ranges from one fourth to three fourths of the normal, or even more in grave cases. This actual condition of reduced breathing power the author terms anhematosis. He refers to it as a definite morbid symptom group which bears the same relationship to the lungs as myocardial insufficiency does to the heart. The condition is especially common in women and children. It is as easily detected with the spiroscope as the temperature is with the thermometer in febrile states. In the neurotoxic vomiting of pregnancy Pescher considers respiratory training the therapeutic procedure of choice. The exercises consist of blowing through a tube either into a bottle containing water (training by sight) or into a basin of water (training by the hearing). Every half hour, day and night, except when asleep, the patient carries out twenty deep, slowly made insufflations separated by intervals of twenty seconds. The patient remains recumbent and motionless during the procedure and an attendant takes charge of the tube and apparatus. Alternate training by sight and by the hearing is given. The blowing exercises, while reeducating the respiration, rapidly produce in the patient the same beneficial effects as attend the carrying of an asphyxiated person into the open air.

The Corneal Suture in Cataract Extraction.—

E. C. Ellett (*Archives of Ophthalmology*, July, 1921) uses the technic described by Kalt, and asserts that it has the following advantages: 1. It reduces the likelihood of vitreous loss to a minimum. 2. It permits simple extractions with a smaller percentage of iris prolapse; if prolapse occurs, it limits its extent. 3. It promotes early closure of the wound, and enables the patient to get out of bed earlier. 4. It enables one to make a more thorough and deliberate toilet of the wound. In this way it lessens the incidence of secondary cataract, and also encourages and justifies operation in immature cataracts. If it can be made generally known that some immature cataracts are safely operable, it will tend to reduce the number of patients who are advised to wait until the cataract is ripe before operation.

Proceedings of Societies

BRITISH MEDICAL ASSOCIATION.

Eighty-ninth Annual Meeting Held in Newcastle-upon-Tyne, July 19, 21 and 22, 1921.

Under the Presidency of Dr. DAVID DRUMMOND.

(Continued from page 555.)

Protein Sensitization and Skin Diseases.—In the section of dermatology a discussion of cutaneous sensitization and focal sepsis in the etiology of certain skin affections was opened by a paper by Dr. HAROLD W. BARBER. Credit is given to Chandler Walker for calling attention to and emphasizing the fact that, apart from hay fever, a considerable percentage of patients with true asthma are sensitive to one or more proteins, either of animal, vegetable or bacterial origin, the asthma being part of a general reaction in the individual toward the offending protein. Credit is also given to the work of O. M. Schloss in a similar direction, and it is pointed out that since Schloss's work numerous important papers have been written upon the subject, although they do not appear to have obtained much recognition in Great Britain. Barber holds that heredity is an important factor in many cases of protein sensitization, and that it is probable that acquired sensitization to food and bacterial proteins depends frequently on the state of the alimentary canal, and that incomplete digestion, or a catarrhal condition of the intestinal mucous membrane, may result in the absorption of proteins direct into the blood stream, thereby rendering them capable of acting as antigens. Summing up our present knowledge of protein sensitization it might be said that certain persons have a peculiar tendency to exhibit toxic symptoms when exposed to the influence of certain food, animal plant or bacterial proteins, drugs, or chemicals, that this tendency is very markedly hereditary, and that idiosyncrasy toward more than one substance is the rule.

Eczema.—With reference to eczema, the most important and frequent skin affection attributed to protein sensitization, the author pointed out that the association of that type of reaction of the skin which is termed eczema with protein sensitization and focal infection was definitely established, and in connection with this branch of the subject he considered first eczema due to external irritants and then eczema in infants and adults of internal origin. Attention was drawn to the fact that there were some irritants which would produce acute eczematous dermatitis on practically every skin, but, on the other hand, it was observed that, as in the case of susceptibility to foreign proteins and drugs absorbed from within, some persons seemed to have an inborn intolerance of certain substances applied externally and in others such intolerance was evidently acquired. It was common knowledge that in certain trades a person might be exposed for years to an irritant, without ill effect, when suddenly his resistance broke down and an acute dermatitis

resulted. In many cases subsequent exposure to the irritant, even in small quantities and for a short time, would always cause a recurrence of the dermatitis, although in others tolerance was reacquired. These irritants might be either protein or nonprotein substances. It was difficult to bring such cases of sensitiveness towards drugs and nonprotein irritants into line with susceptibility towards proteins, since a true anaphylactic reaction was only supposed to be possible with protein bodies. It had been suggested that drugs, chemicals, etc., combined with the body proteins, and that it was towards these compounds that susceptibility occurred. There was certainly evidence in favor of this view in the case of salvarsan. However this might be, the phenomena of idiosyncrasy towards drugs, chemicals, etc., and towards proteins were so similar that they might all be conveniently termed anaphylactoid, and it should be particularly noted that positive cutaneous reactions could be obtained with both protein and nonprotein substances.

Infantile Eczema.—With regard to eczema in infants, there were two main types, apart from that produced by external irritants, and it was the failure to recognize this fact that had made infantile eczema "the *bête noire* of all dermatologists," as Engman and Wander expressed it. There was first the type that was so common in the outpatient department of hospitals in poor districts, and which corresponded to true seborrheic eczema in adults. It affected the scalp, the postauricular regions, the face around the nose and mouth, the neck and the flexures. Its onset was often sudden and oozing took place rapidly, so that secondary infection occurred early, resulting in impetiginization. This condition, as with the impetiginized seborrheic eczema of adults, was often wrongly diagnosed as impetigo contagiosa, and surprise was expressed at the unsatisfactory results obtained when the orthodox treatment for that disease was adopted. This form of eczema was apparently associated with excessive carbohydrate feeding. In the second variety of infantile eczema the clinical picture was quite different, and it was usually possible to distinguish between the two at a glance. It was this type which was probably always due to susceptibility towards one or more foreign proteins, usually, of course, those of food substances. These children, on the whole, conformed to a definite type. They were, even in early infancy, emotional and diffident, but withal charming and abnormally intelligent. In later life they were likely to become asthmatic. As regards their skin, it would be found that it was often slightly, sometimes definitely, ichthyotic, and the author was convinced that ichthyotics were not only abnormally susceptible to external irritants, but were also frequently subject to anaphylactic eczema and asthma. Apart from its dryness the skin of these children felt thickened, and had a peculiar yellowish color, and there was often hyperkeratosis around the pilosebaceous follicles.

The eczema took the form of diffuse scaly patches, which became thickened; they were situated on the forehead, the cheeks, the extensor surfaces of the limbs, the trunk and sometimes in the flexures. Oozing did not regularly occur, although it was often provoked by scratching, nor was secondary impetiginization nearly so common as in the first type. One characteristic feature was that the eczematous patches might become quite pale and almost invisible in the course of a few hours, only to flare up when a paroxysm of itching or a fit of crying occurred. This was not the case in the first type in which, too, the itching was not so intense. In both types the eczema was likely to be accompanied by nasopharyngeal and bronchial catarrh, but in the first the catarrh tended to be persistent, whereas in the second, it waxed and waned *pari passu* with the intensity of the eczema. It was the second type which corresponded to Czerny's description of the exudative diathesis, although later observers, Barber himself included, had confounded the two types. Probably most of the symptoms which Czerny described as characteristic of his exudative diathesis were manifestations of protein sensitization. Engman and Wander found that of the exudative type seventy-five per cent. responded positively to some protein sensitization; of the remainder probably some were wrongly included in the exudative group, or the protein to which they were susceptible was not discovered. In those results in which control of the diet could be maintained brilliant results followed. Although in children it was to food proteins that susceptibility was observed, in a few cases, as in asthma, the offending protein might be bacterial and Whitfield (*Skin Diseases and Their Treatment*, 1921), described the case of a child aged three years, who suffered from eczema and spasmodic cough, which were relieved by the removal of septic tonsils and adenoids. It was possible that in this case the child was primarily susceptible to one or more food proteins, and became secondarily sensitive to the bacterial infection of its respiratory tract.

Eczema in Adults.—Barber went on to say that, as might be expected, eczema in adults was far less likely to be due to food sensitization than was the case in children, since complete or partial tolerance to foods was usually acquired as the child grew older. There was no question that some cases of chronic eczema were directly or indirectly due to focal infection, particularly oral sepsis, and Ehrmann used to lay stress on the association of eczema and chronic appendicitis. In Barber's experience that type of eczema termed nummular which began by multiple discoid patches situated most commonly on the backs of the hands, the wrists and forearms, and the extensor surfaces of the thighs and legs, was a frequent concomitant of oral sepsis, and he had had several cases during the past few years, which cleared up when this was dealt with, and in which other methods of treatment had proved only palliative. Barber concluded that the subject with which he had attempted to deal was so large, and was connected with matters about which there was so much controversy, that he was afraid his review of it was not only incomplete but

singularly disjointed. It might, however, be safely affirmed, even with our present knowledge, that further study of individual peculiarities toward foreign proteins and bacteria was likely to solve some of the dermatological problems which remained, but in this kind of research the dermatologist could not hope to succeed alone. By careful clinical observations in large numbers of cases he might formulate theories, based on deductions made from such observations, and he might direct a line of research which appeared likely to solve the problems before him, but his theories must always be tested by those who were expert in laboratory knowledge and technic, and it was on the correlation of clinical data and laboratory findings that the future of dermatology depended.

Renal Function Tests.—At a joint meeting of the sections of medicine, pathology and bacteriology, and physiology, pharmacology, therapeutics and dietetics, a discussion was held on renal efficiency tests. Dr. FRANCIS D. BOYD, professor of clinical medicine, University of Edinburgh, read a paper on the subject, laying stress on the point that the consideration of the soluble nitrogen of the blood as a test of renal function was of the greatest importance from a therapeutic aspect. Without a knowledge of the proportion of nonprotein nitrogen of the blood the adequate dietetic treatment of a case of nephritis was impossible. Given that knowledge, one would find that if the soluble content of the blood was raised, a rigid protein free diet would have a definite beneficial effect in diminishing the waste products in the circulating blood and in relieving symptoms. But this rigid protein free diet was not always either necessary or desirable, and it was only by a consideration of the soluble nitrogen content that one was able to say whether it was necessary or not. The author pointed out that it was interesting to note that no conclusion as regards renal function could be drawn from an estimation of blood pressure.

Pleural Empyema.—In the section of surgery, under the presidency of Professor J. RUTHERFORD MORISON, a paper on acute pleural empyema was read by Mr. Henry Wade, F. R. C. S., Edinburgh. It was pointed out the lessons of the peritoneum and the knee were to be applied to the pleura. They were: 1. Surgical intervention at the inception of the infection. 2. Removal of the portal of entrance where such was possible. 3. Free and open operation to obtain this would be warranted in many cases. 4. The method of dealing with a case of empyema would be the one where the suppurating cavity, having been dealt with, would be closed. 5. The data for an accurate prognosis and scientific treatment would be found in a combined bacteriological and cytological examination. 6. The use of this method would probably isolate a group of cases where complete success would follow a treatment consisting of aspiration of the contents of the closed cavity, subsequently repeated if necessary, and combined with the introduction of some mild irritant as is contained in Rutherford Morison's bipp.

At the close of the paper Wade said that, while the treatment of the persistent chronic empyema

cavity hardly came within the scope of the present consideration of the subject, it had been raised already in referring to the use of the Carrel-Dakin method of treatment. It suggested one other thought to him. He would like to bring forward a suggestion which, perhaps, was worthy of being tested, and it was whether a similar or even a better result might not be obtained by the use of bipp, or possibly even simple paraffin, which had the great advantage over Dakin's solution of being able to be used in a closed cavity. This suggestion was based on certain observations he had been able to make during the war. Bipp was employed in many cases of septic wounds. One feature was most noteworthy in all of them, and it was the astonishing change that took place in the degree of induration of the neighboring parts even where it had failed to cure the source of infection, as where a knee joint had been treated with bipp and amputation later on had to be carried out. At the time of the original treatment the inflamed parts in the neighborhood of the wound were firm, tense, indurated and fixed together; whereas, a week or two later, as was confirmed at the operation, they were soft, pliable and mobile. It appeared to him that the paraffin in the remedy was probably responsible for this, and in support of this idea he would quote the results obtained by the use of ambrine, or No. 7 paraffin, in the treatment of burns. In these cases a similar result followed its use. Soft and delicate tissues surrounded the site of the primary damage, so that when the wound healed the best and most delicate of scars resulted. Beck's paste probably also owed its great value to a similar cause.

Wade wished to offer the following suggestions concerning the treatment of pleural empyema: 1. A combined cytological and bacteriological examination of the fluid withdrawn from the pleura should be more widely employed as offering the prospects of affording fuller and more accurate data on which to found our operative treatment. a. Suppuration within the pleural cavity was especially suitable for treatment by methods which obviated the necessity of opening the chest, or by methods where an immediate or early closure after it had been opened were carried out. The value of the treatment by aspiration alone should be again carefully reviewed. 4. The value of methods, where, after aspirating the content, an antiseptic was introduced, such as Murphy's method, where two per cent. formalin in glycerine was introduced, should be further considered. 5. Where simple drainage was practised the ideal opening was not only one which allowed free escape of the purulent content at the time, as when a rib was resected, but it should also be such as readily sealed itself off when the tube was withdrawn, as when minor intercostal thoracotomy was performed. 6. The benefit to be derived from a free opening of the pleural cavity by major intercostal thoracotomy warranted its employment in cases which gave promise of developing into chronic and persistent cases. 7. The value of disinfection and immediate closure in these cases should be more fully tested. 8. The Rutherford Morison technic was the best at present available for carrying out this procedure.

Intestinal Injuries.—Mr. G. Gordon Taylor, surgeon to the Middlesex Hospital, pointed out that it was the traumatic rupture of intestine without any penetrating wound of the abdominal wall which was so difficult of diagnosis. James Berry and Paul Guiseppi at the end of 1908 made a valuable contribution to the subject, basing their findings on 182 cases admitted to ten London hospitals in the fifteen years from 1893 to 1907 inclusive. They affirmed that the diagnosis of rupture of the bowel did not rest upon any single symptom or sign, but upon a careful consideration of all the facts dealing with the particular case under treatment; every case of abdominal contusion should be looked upon, when first seen, as one of possible severe intestinal injury. Much help might be obtained from careful attention to the history of the accident.

Although intestinal lesions were generally the result of the more severe forms of violence, nevertheless, it must be borne in mind that the fatal visceral rupture might be caused by an apparently trivial blow. V. Zachary Cope reopened the subject in 1913, and at the discussion which followed his paper and which dealt with the reports from ten London hospitals upon forty-four cases admitted during the five years from 1908 to 1912 inclusive, it was pointed out that the more important symptoms detailed corresponded very closely with those in Berry and Guiseppi's series and could be arranged in order of frequency thus: abdominal pain, with or without marked tenderness; rigidity; vomiting, rising pulse; marked shock; bruising of the abdominal wall; dullness in one or both flanks; diminution or loss of liver dullness. Sir George Makins especially emphasized the importance of sharply localized tenderness, which, although not constant, was, when present, the most valuable indication of all. Sir Berkeley Moynihan noted the value of Claybrook's sign which consisted in the transmission of the cardiac and respiratory sounds, so that they could be heard all over the abdomen as well as, or possibly better than over the chest. Cope urged that if chest and kidney injury could be excluded, ruptured bowel should be suspected: 1. When abdominal pain persisted for more than about six hours after an injury, especially if the pain was accompanied by a, vomiting, especially bilious vomiting; b, a gradually rising pulse; c, persistent local rigidity which tended to spread; d, deep local tenderness with shallow respiration. 2. When abdominal pain was absent or very slight, but the pulse rose steadily and the patient was very restless or listless. It was important to exclude a spinal injury before making a diagnosis of intestinal rupture. The prognosis was so intimately related to early diagnosis and to early operation that the patient should be kept under the closest observation and the pulse rate counted at least every half hour and Taylor would submit that whenever there was the slightest suspicion of any intestinal lesion the abdomen should be explored forthwith. The diagnosis of intestinal injuries due to penetrating wounds of the abdomen was less difficult than of nonpenetrating wounds, but Taylor emphasized the fact that in the abdomen there were no insignificant wounds.

Industrial Hygiene.—Sir THOMAS OLIVER, of Newcastle, in an address on industrial hygiene, pointed out that Great Britain was the pioneer in industrial legislation and sketched the history of the industrial revolution in that country, which began about 1740. He emphasized the fact that occupation was never meant to cripple workmen, to cause ill health, or to induce early death. It was thus that medicine was drawn into the social movement in which it plays an honored part today. In few fields of human activity had the call for preventive medicine been greater than in the various industries of Great Britain, with their former high mortality and sickness rates. Society in the past kept itself too far aloof from knowledge of the conditions under which certain trades were carried on, and even the workers themselves were not always aware of the dangers to which their employment exposed them. It became necessary to instruct workers and employers in regard to occupation and health.

Sir Thomas Oliver dealt with lead poisoning from all points of view, as well as discussing the questions of phosphorus poisoning and the manufacture of lucifer matches, carbon monoxide poisoning and mining. With reference to mining, the speaker said that although a hazardous occupation, mining was not so dangerous as it was a few decades ago. In 1851 the number of miners killed by accident was 4.35 in 1,000, in 1912 it was 1.37 in 1,000, a reduction of two thirds. The largest number of accidents occurred between the ages of twenty-five and thirty-five, and the same remark applied to accidents which disabled men for more than seven days. The reduction in the number of deaths of miners was the result of careful inspection of the air in particular workings before the miners descended, of better signaling and improved ventilation by the double shaft system.

Industrial Fatigue.—With respect to fatigue, one of the most important phases of industrial hygiene, the speaker drew attention to the fact that the conditions of labor in connection with fatigue had altered very considerably during the past one hundred years. Men took things more quietly then; there was neither the strain nor the competition characteristic of modern times. Hard work was followed by fatigue then as now but it affected principally the muscular system. Collective work was carried on in overheated factories amid the din of machinery and it demanded close attention. The reality of fatigue was brought home by the large number of men and women who broke down in munition work during and after the war. There was a limit beyond which the human machine could not produce satisfaction. After describing fatigue from the scientific point of view and pointing out that it was not confined to living tissue alone, for a similar event occurred in the inorganic world, the speaker said that it would be of the greatest assistance if we could, with a certain degree of definiteness, ascertain just what number of hours a man could work before his energy began to fail, for once this took place work was unprofitable. As regards fatigue, much would depend upon the previous health and upbringing of the worker, how he was fed and housed, and how he spent his leisure.

Health Legislation.—The effect of health legislation on the health of the people was discussed. Captain WALTER E. ELLIOTT, M. C., M. P., introduced the discussion and said that there was at the present time a great wave of feeling against State interference of any kind; but it would be fatal and tragic if it allowed the people to despise or ignore the great results which had come about from public health legislation in the past. The public had forgotten the benefits, and they resented the shepherding to which they were going to be subjected. That should be reduced to a minimum, but at the same time the great good that had been done by a small amount of restrictive legislation should be remembered. He concluded by saying that legislation had done enough to warrant them to continue along the same line.

The Importance of Industrial Medicine to the Community.—The discussion of this subject was opened by Professor E. L. COLLIS, of Cardiff, who said that the peculiarities of industrial disease were important in drawing attention to the influence of occupation on health. It was recognized that industrial medicine aimed directly at preventing disease and maintaining health. The State was undertaking to bring up to adolescence healthy individuals. Employers must in turn maintain that health.

Sir KENNETH GOADBY, of London, who took part in the discussion, said that in certain industries, for instance, lead working, doctors were hampered by the well meaning obstruction of employers and employed in efforts to improve their conditions. He dealt with lead poisoning at some length and pointed out that lead acted on the reproductive system and tended to reduce the birth rate. Sir Kenneth thought that medical men who were engaged in this work for the health of the nation should receive the hearty cooperation of labor. The statistics of the medical men should not be regarded by labor as an opportunity for prying into their private life.

Dr. HAROLD KERR, medical officer of health for Newcastle, said the work in the canteens and public restaurants, and in the kitchens of hotels, was an industry in itself, and he would like to draw attention to what was rather a paradoxical position. Under the factory and workshops' act, a factory was distinguished from a workshop as being a place in which mechanical power was used. Between the stools of factory and workshop most of these kitchens fell, and the medical officer of health did not know quite whether an inspection of one of these places came within his purview or not. If the position was definitely defined, and it was stated that places where food was prepared and handled should come under the regular and effective supervision of the local public health authority, it would be a very good thing. As it was the occasional visit of the factory inspector, rarely a medical man, was hardly sufficient.

Professor Collis said that the psychological condition of the people had much to do with health, in the matter of industrial unrest. The medical profession had in their hands the key to the whole question of industrial unrest, and it was up to them to see that it was put right.

(To be concluded.)

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NEW YORK, WEDNESDAY, NOVEMBER 16, 1921.

Miscellany.

Chronic Appendicitis.—P. G. Skillern (*American Journal of Surgery*, June, 1921) concludes as follows:

1. Chronic appendicitis manifests itself by disturbances of the digestive tract, and of the nervous system, by various pains and aches—symptoms that rapidly disappear after removal of the diseased appendix.

2. These symptoms vary in number in direct proportion, usually, to the time of existence of the disease and to some extent with the type of the pathological appendix.

3. The diseased appendix is the greatest and most frequent disturber of peristalsis of any of the abdominal organs. The theory here advanced—one that explains the preoperative symptoms as well as the rapid postoperative disappearance of symptoms—is that the appendix at its tip initiates the peristaltic waves of the large bowel, but when fibrosed, kinked, strictured or bound down by adhesions is no longer able to functionate in this capacity; after removal of the appendix the peristaltic waves are initiated at what is now the beginning of the large bowel—the former site of the base of the appendix—and are able to continue unhampered and with regularity.

4. The diagnosis must be based upon a careful estimate of the case together with the results of local examination.

5. In view of the nervous state of many of these sufferers from chronic appendicitis it seems best to remove the appendix under local anesthesia, stealing it during twilight sleep. By this association method untoward reaction from the operation is practically never seen, and the nervous system recovers much more rapidly than after ether anesthesia.

Hepatic and Renal Insufficiency in Cancer of the Stomach.—P. Le Noir, C. Richet, Jr., and A. Jacquelin (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, April 28, 1921) report a study of this subject in seventeen cases and conclude that hepatic and renal insufficiency may be met with in gastric cancer, but are less frequent, and especially, less pronounced than in gastric ulcer. The only symptoms that may be ascribed to one or the other of these conditions are the marked tendency to vomiting or hemorrhage presented by some patients and certain terminal states of delirium, coma, or postoperative shock. The pathological changes found in the liver are discrete and sparse, even in the vicinity of secondary malignant foci, while the renal lesions are more frequent but seldom intense. In combined ulcer and cancer of the stomach, hepatic and renal insufficiency is more pronounced and almost constantly present.

Nocturnal Polyuria.—Joseph H. Barach (*American Journal of the Medical Sciences*, April, 1921) avers that nocturnal polyuria is a highly diagnostic symptom of an established subacute or chronic nephritis. It occurs independently of arterial hypertension. The quantitative analyses show a complete reversal from the normal in the amount of work accomplished by the kidneys during the day and night periods. Observations upon patients having nocturnal polyuria show that it is not the result of heavy evening meals, physical exertion, arterial hypertension, nor the horizontal posture. The most probable cause seems to be found in the physiological adjustments in circulation incidental to sleep. The evidences gathered in these observations suggest that nocturnal polyuria is primarily a manifestation of increased elimination of water because of a more favorable state of the renal circulation and that the increased elimination of salts is coincidental rather than causative.

The White Adrenal Line (Sergent); Its Clinical Significance.—Willard E. Kay and Samuel Brock (*American Journal of the Medical Sciences*, April, 1921), from the study of a series of two hundred and fifty-five cases of a variety of diseases and normals, in which numerous pharmacological and other tests were performed, feel justified in asserting that the so-called white adrenal line of Sergent is a local vasomotor reflex, resident in the skin, bearing no direct relationship to adrenal gland activity. The reasons of postulating the above are: Its independence of blood pressure, acute fatigue and other signs of hypoadrenia; its frequent occurrence in normals and in a variety of diseases unassociated with hypoadrenia; its reappearance in the face of persistent general manifestations of adrenalin subcutaneously administered; its peculiar association with scarlet fever. It would appear that the state of the vasomotor system which allows of its best exhibition is found in young adults of either sex, and especially in the exanthem of scarlet fever. On the basis of the series quoted it may be stated that this line has not the clinical significance attributed to it. In spite of the various hypotheses evolved regarding it, further work seems necessary to establish the exact physiological mechanism of this remarkable vasomotor phenomenon.

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WHOLE No. 2222.

A Difficult Case of Bronchoscopic Foreign Body Extraction Complicated by Pyopneumothorax*

By HENRY LOWNDES LYNNAH, M.D.,
New York.

CASE.—F. J., a boy seven and a half years old, was referred to me by Dr. Fidler, who reported by radiographic plates a foreign body in the left bronchus opposite the upper lobe orifice. As I was absent from the city at the time on account of illness in my family, I did not see the patient. The parents were advised by Dr. Fidler to wait until my return to the city, for the foreign body had already been in the lung for a period of two years. The parents wishing the foreign body removed at once took the child elsewhere. Some ten months later the father came to my office with his boy, who was at that time in poor condition and expectorating large quantities of foul smelling pus. The history was as follows:

The father had remembered that the boy had put a double pointed brass paper clip in his mouth and swallowed it. The family physician was notified, and he had told them not to worry, as the paper clip had been swallowed and would pass out naturally. There was no cause for alarm. After this advice no further attention was paid to it. The boy did fairly well for five months, although he had a cough. Bronchopneumonia developed, which later was pronounced tuberculosis, and the patient was sent to a tuberculosis camp, even though no tubercle bacilli were found in the sputum. He continued to grow worse and his cough became very troublesome. As he did not improve the father took him away from the sanatorium, under protest, after a year and a half and brought him back to die. It was at this

time that another physician examined the boy and suggested that an x ray examination be made for a lung abscess, as this had never been done. He was taken to Dr. Benjamin Fidler, who, as stated before, made the radiographic plates.

The boy, at the time he came to my office, was in poor condition. There were many subcrepitant râles in the left lung and bronchial respiration over the lower lobe. Further x ray plates were made. The father informed me that two unsuccessful attempts were made to re-

move the foreign body, but the doctors said it was impossible to do so, for it had gone further down in the lung and could not be removed. The radiographic plates confirmed the father's statement, for the foreign body was found to be down as low as it was possible to go, and from the radiographic measurements seemed to be almost completely out of the small posterior lobe bronchus and in lung tissue. After a study of the x ray plates an attempt was made to remove the foreign body one week later, a tube five mm. by forty cm. being used. There



FIG. 1.—The original position of the foreign body radiographically located to be in the left bronchus opposite the upper lobe orifice. It had been in this locality for a period of two years. (Plate by Benjamin Fidler; retouched for clearness.)

was a firm stricture of the dorsal branch of the left lower lobe bronchus which had to be dilated first. There was much pus oozing out of a small opening in this bronchus. After dilatation the five mm. tube was gently introduced through the stricture and a small point of paper clip was seen. This was grasped with a small pair of straight forceps, but it would slip its hold with each attempt to extract the clip. Gentle traction was used for fear of causing pneumothorax from lung rupture if too much force was used. Further x ray plates were made and the foreign

*Read before the Annual Meeting of the Association of American Peroral Endoscopists, Brooklyn, N. Y., June 5, 1920.

body was seen to be in the same position. Dr. Jesse Bullowa, who had kindly assisted me at the operation, made a thorough physical examination and thought the sounds were clearer since the evacuation of the obstructing pus, and established drainage by dilatation of the bronchial stricture.

On February 27, 1919, one week later, a second

turned to bed in good condition, and after a careful physical examination by Dr. Bullowa and a fluoroscopic and radiographic examination by Dr. George S. Dixon, he was sent home the same afternoon. The foreign body had not been displaced.

Forty-eight hours after the boy had returned to his home, and after his dinner, he complained of a severe pain in his stomach. As I was absent from



FIG. 2.—The location of the foreign body after it had been pushed or had gravitated into the lower lobe branch. Note that the anterior posterior plate shows the foreign body to be well below the dome of the diaphragm. The foreign body was in this locality for a period of ten months. (Plate by H. M. Imboden; retouched for clearness.)

attempt was made with the same result. No damage was done, but the small forceps would not hold. It was at this time that Dr. Bullowa asked a friend, who was in the welding business, to lengthen a short pair of nasal alligator forceps which would hold much firmer than the mosquito forceps of Jackson. Following the second examination the boy seemed



FIG. 3.—A lateral view of the foreign body which demonstrates the reason why it seems to be below the diaphragm in the antero-posterior plate. The paper clip was in the dorsal branch and as low in the lung as it was possible to go. From the size of the foreign body and the depth in the lung, radiographic measurements showed only a small portion of the upper projecting point to be in a small dorsal branch bronchus. The remainder of the foreign body was without the bronchus as it probably had ulcerated through, and was imbedded in the structure of the lung. Note the dense triangular shadow below the foreign body which is "pus sponge soaked lung." (Plate by H. M. Imboden; not retouched.)

to be in good condition, but he did become slightly cyanotic while I had a firm hold and was making gentle traction on the clip. However, he was re-



FIG. 4.—Pyopneumothorax within the left thoracic cavity with displacement of the left lung and heart shadow to the right. Note the crowding of the foreign body against the right lung which is displaced well to the right of the median line. The diaphragm on the left side is deeply concave from positive thoracic pressure. The dense shadow filling the concavity in the left chest proved by thoracentesis to be very foul smelling pus. (Plate by Dr. Charles Gottlieb; foreign body retouched for clearness.)

the city Dr. Bullowa was notified. He found the boy breathing with difficulty, and on physical examination diagnosed pneumothorax, and said that he also got a splashing sound in the chest on succussion. He informed me on my return that the boy was suffering from a ruptured lung and pyopneumothorax.

On Monday, March 3rd, he was taken to the of-



FIG. 5.—Radiographic plate taken one month after the successful peroral extraction of the foreign body. The left lung is expanding and slowly returning to normal. (Plate by Dr. Charles Gottlieb.)

fice of Dr. Charles Gottlieb and further x ray plates made, which confirmed the physical findings of Dr. Bullowa. He was sent to the hospital and thoracentesis was performed and much foul smelling fluid evacuated. The pleura was then irrigated with Dakin's solution, and the foul odor gradually disappeared. On Thursday, March 6th, the third attempt was made, with Dr. Charles Gottlieb using

the fluoroscope as a guide. The foreign body was now out of position, having been forced over in the right thoracic cavity well beyond the median line. This attempt was successful, and the intruder was removed in a few minutes with the mosquito alligator forceps. Had we used such a pair of forceps which would hold at the former trials we might have been successful, but no doubt the lung would have been ruptured just the same. After the successful extraction of the foreign body the wound in the thorax closed within three weeks.

A radiographic study of the patient's chest one month later showed the lung to be well expanded and returning to normal. After the thoracic wound closed the boy coughed up considerable pus. Two bronchoscopic dilatations later and an application of ten per cent. silver nitrate to some fungating granulations in the lower lobe bronchus entirely cleared up the condition. The boy made a complete recovery. He has been followed for two years and is in perfect condition, his lungs resuming normal function.

INTERESTING POINTS IN THIS CASE.

1. That the foreign body was too large to have gravitated into a small dorsal branch bronchus, and at such a depth in the lung. It probably ulcerated

through the bronchial wall owing to its long sojourn in that locality.

2. That gentle traction on a foreign body in lung structure will produce pneumothorax.

3. The leakage of air producing a positive pressure must have been extremely slow, or else there would have been some alarming symptoms immediately after the second bronchoscopy, and the physical signs and the radiographic plates would have shown this. Pneumothorax had not sufficiently developed to cause symptoms until two days after bronchoscopy. The first symptom was a pain in the stomach. This was due to the depressed diaphragm.

4. Thoracentesis and the use of Dakin's solution undoubtedly

saved the patient's life.

5. Fluoroscopic bronchoscopy was certainly of the greatest aid in the accurate localization of the foreign body when it was pushed well to the right of the median line and crowded against the right lung.

6. The importance of taking radiographic plates immediately after all bronchoscopic foreign body extractions was demonstrated by this case. Failure to find pneumothorax in the x ray plates does not mean that it cannot occur later.

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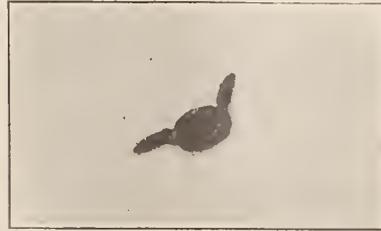


FIG. 6.—Actual size of foreign body.

Mucocele of the Nasal Accessory Sinuses; Two Cases of Pansinus Involvement with Recovery After Interval Operations*

By VIRGINIUS DABNEY, M. D.,
Washington, D. C.

The terms *hydrops antri* to designate mucocele of the antrum, cystic dilatation and serous cysts of the sinus, used loosely by the earlier observers, are to be rejected for reasons not necessary to be discussed here. In their place mucocele may be defined as the accumulation and retention of a mucous secretion within an accessory sinus, generally associated with a distention of one or more of its walls. It is frequently merely a retention cyst, but it is hardly wise to incorporate in a definition conditions and phraseology themselves already matters of dispute. I refer to the suggestion of some observers that the following qualifying phrases be added: "due to closure of the nasofrontal duct," "following trauma," or "associated with exostosis"; whereas, in my opinion none of these is a *sine qua non*. In fact, it has been shown that a mucocele can exist without any of these states. Moreover, we must distinguish between two forms of this condition, i. e., one without tumor formation and one with it; hence, it would not do to specify in the definition that a cystic condition is an essential. Such is my feeling, but I was surprised to find that Raoult is about the only writer who thought it necessary to lay any stress on this distinction.

Mucocele is a rare condition when compared with other forms of nasal accessory sinus disease, as shown by Raoult in his statement that Killian could collect only sixty-four in his search, and, while I have personally examined all available literature on the subject, I can make no definite estimate as the reports are so interwoven with each other and there are so many cross references that there is a baffling reduplication. However, it would be a very nearly accurate estimate to say that seventy-four cases are reported in the fifty-eight articles that I have examined. These are classed as mucocele of the frontal sinus, but several cases are complicated by involvement of other sinuses. Such is the accumulation only since 1881 when Garreau and Bertheux first called the attention of the profession to this condition. After this there were sporadic, unsatisfactory accounts till fifteen years later, when Rollet lent his influence and energy to further investigation and reports, and to him is largely due the stimulus which the study received at this time. Since this time reports have been as frequent as could be expected in a condition as rare as mucocele, but the progress made in the pathology has been marked, despite the many phases which we cannot explain

*Read before American Laryngological Association, May 31, 1921.

As might be expected, it is in the etiology of the disease that we find the least definite knowledge and hence the widest speculation. Some support with much eloquence the view that trauma has a distinct influence, others believe that it is the result of a chronic inflammatory process with retention of the secretion thrown out at this time, rejecting the trauma theory. In view of the history of severe trauma in many of the cases and the well known effect it frequently exercises in predisposition to disease elsewhere in the body, it is neither remarkable nor unreasonable that it should be assigned a causative rôle in this instance, especially as we are groping in the dark for a cause. Moreover, a blow at the internal angular process might cause sufficient disturbance in the region of the nasofrontal duct to produce a closure of this natural exit for the secretion of the frontal sinus and even of the ostium maxillare. Especially might this occur in the young whose bones are easily bent and in whom the sinuses are small and even rudimentary. Thus, in Raoult's case the patient received a blow from a bottle at the root of the nose which left a definite tumefaction for seven years, at the end of which time the mucocele was discovered. In Jessop's case a blow on the eye seemed a predisposing cause, likewise Bertheux's patient had a similar injury, and Bark's patient reported that a blow from a stick at the root of the nose was the beginning of the trouble. Two days after diving six times in the Seine to rescue a drowning man, Demaldent's patient showed a mucocele of the frontal region. An unusual case of trauma was that of Rollet's patient (5), where a blow from a cow's horn on the brow ten years before was accepted as having some relation to the formation of the frontal sinus accumulation. It will be readily seen that in such cases the great objection to the trauma theory is the length of time which is shown to have elapsed between the injury and the discovery of the mucocele. This is, of course, a valid objection, but, while I do not wish to be regarded as accepting unreservedly this explanation of the cause, I do not consider that it is to be thrown out unceremoniously in the investigation of etiology. Certainly as a primary cause as much can be said in its defense as for many of the others. Leggat reports an acute mucocele resulting from a fracture of the external angular process associated with a depressed fracture of the roof of the sinus, the tumor being bluish and soft. If this was not a hematoma, it would appear to have been a case of true mucocele due to trauma, and such I take it to be from his description.

The greater number of observers incline to the belief that the cause is a cystic dilatation of one or more mucous glands, or a cystic degeneration of the mucosa (as in my two cases), or of the polyps therein, and there are still others who believe that closure of the nasofrontal duct is a cause. The cystic degeneration theory is the one to which I subscribe, and I am sure that the closure of the duct exerts a causative influence at times, but it is certainly not an essential condition, as some of the patients show a perfectly patulous duct. One of my patients showed a canal wide enough to admit a large ethmoid curette, and the duct had been open

for years as a result of repeated intranasal operations on the anterior ethmoid. If closure of the duct is causative, which it may be at times, what is the cause, in turn, of the closure? The effect of injury, viewed as somewhat academic if you wish, has been mentioned, but there remains the suggestive fact that the blow occurs nearly always at an age when the frontal sinus is rudimentary and the walls thin, and the anterior ethmoid cells from which the sinus is developed, are exposed to the same shock; hence it is not impossible for trauma here to cause obstruction. Congenital narrowing of the duct, rendering a catarrhal inflammation obstructive, is a likely cause. A high deviation of the septum pressing well into the infundibulum associated with an inflammatory process in the naris on that side was almost certainly the cause of the nasofrontal closure in one of my cases. Congenital absence of a communication between the nose and the frontal sinus has been reported by several and is sustained by Kuhnt. This doubtless would explain some of the cases in young persons but hardly those occurring in the aged. The presence of bony tumors or bony thickening in diffuse form in the interior of the sinus has been found by numerous writers [Valude, Luc (12), Barwell, Manasse (15)] especially at the nasofrontal duct region, and constitute occasionally a cause of obstruction. Their presence, of course, suggests if it does not actually prove the previous existence of a chronic inflammatory process, an extension from the nose, very probably. The bony hypertrophy on the floor of the sinus referred to by a few authors (Valude, de Lapersonne et Panz, Boël) is not confirmed by an equally numerous company (Raoult, Bark, Bertheux, Hallauer, de Sojo, Mei, Silcock, Spenser-Watson and myself).

This is essentially an affection of the young, the great majority of patients being from thirteen to thirty years of age. However, in my two cases the patients were twenty-five and sixty-two years of age, and I find that Hambresin reports one of sixty-one years, and Buys and Van Lint's patient was seventy-five when first examined by them. It may be stated as definite that the youth of those suffering from mucocele is one of the diseases distinguishing characteristics. An affection peculiarly chronic, without any demonstrable infection usually, and taking months and even years to develop its full magnitude, it is not especially remarkable that the symptoms of mucocele should be so seldom seen or felt till late. While the discussion has been concerned principally with mucocele of the frontal sinus, where it is most often seen and its presence is most readily detected, comment is presumed to cover the similar condition in the other sinuses, *mutatis mutandis*.

The symptoms are the same, except those particularly affecting the eye, such as displacement and visual irregularity, as seen in the frontal and sphenoid involvement. Frontal headache, a sense of weight, and a feeling that the two sides of the head are different are the most common symptoms. Where tumor formation is advanced, there may be displacement of the eye, diplopia, or even bulging of the brow. Where the antrum is involved, the cheek may have the same feeling as the brow and forehead in the frontal cases, though the teeth occasionally

cause pain. Dunning's case showed involvement of both frontals and a mild invasion of the antrum and ethmoid, but only the frontals gave any symptoms. Thus Luc's case, despite involvement of the antrum, gave nothing but frontal signs. So slowly and insidiously do mucoceles develop that it may be stated as true that no symptoms are noticed by the patient before the tumor formation is advanced or the retention of a large mass of mucus is established. One of my patients exhibited no signs of her trouble other than polyps and asthma for six years after the beginning, if not the actual establishment of the mucocele condition. The other showed caries of the ethmoid and polyps with occasional asthma for eight years after the beginning of the cystic state. A symptom, or rather sign, upon which Rollet lays great stress, is the presence of an eburnated mass at the root of the nose, which he says is noted by Langenbeck, Valude, Mei and Tilley. Raoult observed it in his case and says it existed for six years after the trauma up to the discovery of the mucocele. This certainly indicates an inflammatory reaction with a possible periostitis, such as a blow could readily cause, and brings up again the question of trauma as a cause.

The absence of pain in most cases and the search for relief by the patient only when the deformity or sense of pressure is great are the outstanding features in the symptomatology. Where the floor of the frontal sinus is thinned and pressure is directed immediately upon the globe, diplopia or fixation of the eye may be the first symptom; where sphenoid involvement is marked there may be disturbance of vision, but rarely occipital headache which might be expected. Drooping or slight edema of upper lid is occasionally found. One of my patients showed marked loss of vision and drooping of the lids but no double vision or fixation; here the sphenoid disease was marked. Examination of the nose rarely is of any assistance in suggesting the condition in the sinuses, as the interior is generally normal, though in de Sojo's case there was seen a reddish, soft, round mass blocking respiration. Likewise, Dunn's patient showed a nasal growth pressure upon which was transmitted to the swelling at the brow. Both my patients had shown gross intranasal disease for years. However, these few exceptions only serve to emphasize the absence of intranasal signs in most cases.

The fluid found in the sinuses is generally much thicker than ordinary sinus mucus, tenacious, and comes away in long wormlike masses. It varies in color, according to the testimony of different observers, being variously characterized as honey yellow, amber, pinkish gray, and gray with black or reddish streaks. Upon analysis it shows cholesterin, the bile pigments, fat cells and crystals (Mestrez). In the cases showing definite cystic degeneration the morbid anatomy is that of such degeneration elsewhere involving a mucous surface.

As has been mentioned, the progress is markedly slow and innocent, essentially chronic, and some patients have gone as long as eighteen years after the appearance of a swelling before considering it necessary to consult a doctor (Rollet). On the other hand, Demaldent's patient waited but eight days.

While the contents of the sinus can become infected and even break down, this is rarely seen, and even gross involvement of the sphenoid does not seem to jeopardize the prognosis. Spontaneous opening of the duct and ostia and drainage have been observed with cure (Boissarie, Spenser-Watson), of course only in the simple type without definite cyst formation. In a number of cases in which serious complications were unsuspected and would have developed, it so happened that the sinus was opened and the impending trouble uncovered, though not always in time for a cure. Thus Luc found meningitis and brain abscess after nearly completing his operation, and in another case there was an exposure of the dura mater.

In the early stages when there are few or no subjective symptoms a diagnosis of mucocele is practically impossible, but later when the radiograph is employed and the local signs in the cheek or brow or the loss of visual power, with diminution of the visual field, are suggestive, the diagnosis is more simple. The nature of the tumor is discovered only at operation in some cases or on tapping and examining the fluid. Occasionally it has to be differentiated from so simple a condition as lachrymal tumor (Valude, Mei), but probing of the canal should clear up the difficulty. Malignant tumors are found in this region and are not always easy to differentiate, though sarcoma and fibrosarcoma are harder to the touch, with a "knobby" feeling. Their course is much more rapid and the subjective symptoms more pronounced, especially the pain. In the case of a hydatid cyst of the frontal sinus, instances of which are reported by MacKeate and Gosselin and Rouge (see Raoult), the course and symptoms are so similar to those of mucocele that an examination of the contents alone would show the true nature of the growth. Likewise would dermoid cysts of the upper anterior wall of the orbit cause confusion in diagnosis, to be resolved only by puncture of the mass and examination of the fluid contents. It hardly seems necessary to mention meningocele as this is a congenital condition, occurring only in infants, the tumor transmitting the respiratory movements. It is a compressible tumor and pressure provokes cerebral symptoms (Raoult). However, an x ray examination alone may show the presence of a communication between the cranium and the growth or the sinus, as the case may be. Gummata can be ruled out only by the Wassermann test, while empyema will prove more difficult to differentiate than any other condition. However, with the latter the pain is greater, the skin overlying is likely to be red, the lid swollen, chemosis often present, and there may be fever. In short, all symptoms are exaggerated and the patient looks distinctly ill. There is likely to be pus in the nose, in or near the infundibulum, or about the posterior ethmoid region, but again, puncture of the mass when it presents in a convenient position may be the only means of identification. Puncture, to which the French observers resort frequently, is a proper procedure under rigid precautions but is not to be lightly undertaken, as it is certainly not free from danger.

The prognosis of mucocele is uniformly good, except where it is complicated by malignancy and, in

my opinion, there is but one treatment, and that is operative and radical. The Killian and the Luc-Caldwell operations are the only procedures that commend themselves to me, to be modified, of course, in the presence of unusual conditions. But the method should always be radical and the drainage well established. I mention this as some writers do not open the nasofrontal duct where this seems well closed, either by bone or fibrous tissue. To me this seems bad surgery and to be an invitation to recurrence and, what is more certain, reopening of the sinus when the reinfection does occur. Their theory is, perhaps, that closure will prevent a recurrence, as we seek to shut off the Eustachian tube infection in the radical mastoid operation, but the cases are not similar and it is yet to be proved that mucocele of the sinuses is due to infection carried through the nasofrontal duct.

CASE I.—Mrs. J. V. S., married, twenty-five years old, with one healthy child. Negative for tuberculosis and syphilis. Chief subjective symptoms: asthma, nasal stoppage, burning, stinging sensation in nose and forehead, frequent colds which always precipitated asthmatic seizures. The patient considered that her trouble dated six years back. For the past six months she had had repeated removals of polypi, but said that cocaine poisoned her. This alleged idiosyncrasy was later found untrue, as she had been allowed to swallow the drippings from the pledgets in the nares, and a very natural intoxication followed. I found that the lightest pressure over the brow on either side caused pain and likewise over the antra. The lids were slightly swollen and perhaps there was a slight bony enlargement at the root of the nose, the symptom on which Rollet and others lay such stress. The interior of the nose showed a very pale mucosa, a high deviation of the septum to the right impinging on the semilunar hiatus, from which, or at least about which, there was much thick mucus. Polypoid degeneration of the middle turbinate, at least what had been left of it, was plainly seen. Such was the picture in both nares. Transillumination showed both sides dark and an x ray strongly suggested involvement of all the sinuses. Later I attempted to clear away some of the polypoid mass the better to see conditions, but the neurosis of the patient was so great that I was not successful. Her eyesight had been failing for some months and the vessels in the eye ground were found to be engorged and the blind spot much enlarged.

Being reasonably sure of my diagnosis of mucocele I did a classical Killian operation on both sides. The bone was found of paper thinness over the frontal sinuses, whose interior was tightly packed with soft cysts which bulged into the bone opening at the first stroke of the chisel. Thick, grayish mucus, but no pus, was found in long, tenacious ropes. The floor of the sinus was much thinned. The nasofrontal duct, on each side, was found patent, but was enlarged, of course, as one of the usual steps of the operation. Convalescence was without incident. However, a year later the right side showed signs of obstruction and it was reopened and found full of pus; so I made the duct much wider and there was no further trouble. Six months later

I did a double Luc-Caldwell operation and found the same type of disease in the antra, but with these additional conditions: an erosion admitting the little finger tip in both nasal walls, a similar opening, a little smaller in the left external wall, marked thinning of right external wall. This operation seems to have been as successful as the Killian, as the asthma has cleared up and the patient has no pain or discomfort except when she gets a bad cold. Nasal irrigation serves to cure this.

CASE II.—Here we had to deal with a nasal condition certainly of thirty years' duration, though, of course, the mucocele history was not of so long standing. This patient, a woman sixty-two years of age, having one healthy child and one suffering from general epilepsy, gave a negative history for tuberculosis and syphilis but insisted that she had had trouble in nasal respiration for thirty years during which time she had had numerous operations for removal of polypi and ethmoid disease. Her eyes had been gradually failing for some years, but the chief symptom she gave was a feeling of numbness over the top of the head and fulness in the cheeks. Asthma was also a prominent symptom. The interior of the nares showed the effects of the surgery she had undergone, chiefly in the removal of the middle turbinates and the anterior ethmoid cells. From the posterior ethmoid, the labyrinth, and the sphenoid wall small polypi were dependent, and from the semilunar hiatus thick mucus was exuding. Pressure over the frontal sinus or antrum seemed to give no pain. Headache was constant and severe.

Transillumination was not satisfactory, as much bone had been removed from the interior and the picture might have misled, but the x ray was confirmatory of the diagnosis of pansinus trouble. The eye examination showed an immensely enlarged blind spot and many tortuous vessels in the fundus, engorged and very red. The eyelids were somewhat swollen but there was no chemosis. A bilateral Killian operation was done and the findings were characteristic: many cysts and much thick, yellowish, blood streaked mucus. While no erosion in the tables was found the cavities were enlarged and distended and a small erosion was present in the nasal process of the right superior maxilla. Just before operation the patient blew her nose rather vigorously and air escaped into the lower lid through this opening. The nasofrontal ducts were widely open, being about the only desirable result obtained by all the intranasal surgery which she had had. Four months later a bilateral Luc-Caldwell operation showed similar conditions to exist with this further finding: half the nasal wall on each side was gone. There has been no recurrence. Careful questioning as to the type of operations she had had and the nature of the material removed from the nose, together with the symptoms she gave, led me to consider that the mucocele had existed probably ten years, certainly eight.

These two cases present the classical symptoms and the extraordinary features that make mucocele of the nasal accessory sinuses an interesting study. The nature of the growths, the type of secretion, the long duration and insidious development, the lack of insistent symptoms, distention of the cavities,

were all present in more or less degree, and there was an almost total absence of constitutional signs so far as either doctor or patient could ascertain.

The literature on this condition is rather extensive for so rare a disease and I have appended a list of some fifty-eight contributions, for the benefit of those who may wish to pursue further this study. From this number I have quoted not all, though I have read them, save the Russian article, and wish to acknowledge especially my debt to Raoult, from whose paper I have quoted freely and often.

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1633 CONNECTICUT AVENUE.

Treatment of Recurrent Pleurisy by the Injection of Oxygen

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CASE I.—N. S., male, aged sixty-seven years, a native of the United States, hostler by occupation, was brought to St. Peter's Hospital, Albany, N. Y., in an ambulance on March 4, 1921. His complaint was pain in the left chest and lumbodorsal region, shortness of breath, and extreme weakness. All the members of his family were dead, including three brothers and two sisters, causes unknown. He himself had always been in good health and never had had any acute illness. Cardiorespiratory history was negative until the onset of the present illness. He worked as a helper about stables; used alcohol and

tobacco moderately. Nocturia once or twice, quantity said to be normal. Denied lues and Neisser infections. Present illness began nine or ten days previously while at work. He had a chill, felt weak, exhausted, and went to bed with severe headache and anorexia. He was confined to his bed until entrance into the hospital.

PHYSICAL EXAMINATION.

Patient was obliged to sit up in bed on account of the presence of marked dyspnea. His facial expression was anxious and there was some cyanosis. Skin was warm, dry and rough; pupils



FIG. 1.—X ray picture taken on March 11, two days after two quarts of liquid were aspirated from left chest, showing complete refilling of the left pleural cavity.

equal and reacted to light; tongue was dry, covered with a dirty brownish grey coat and breath was foul. Teeth were bad, with infected gums. Throat was negative.

CHEST EXAMINATION.

Respiratory movements were much accentuated on the right side, greatly diminished on the



FIG. 2.—X ray picture taken on March 11th, directly after two quarts of fluid were withdrawn from the left pleural cavity by gravity.

left. Breathing was labored and largely abdominal in type. Vocal fremitus was markedly decreased and absent below the second interspace on the left side. There was flatness over the whole of the left chest below the second rib. No breath sounds were heard below the second rib anteriorly and spinous process posteriorly. Percussion note was hyperresonant over right chest, harsh breathing over right lung, emphysematous in type. Some dry coarse râles were heard posteriorly at the base of the right lung.

Apex beat was weak, felt six cm. to left of the midsternal line. There was no friction rub. Dullness was increased between third and sixth ribs to the right of the sternum. Sounds at apex were weak, distant, with marked irregularity and difference in quality of the beats. All the heart sounds were distant; the second aortic was louder than the

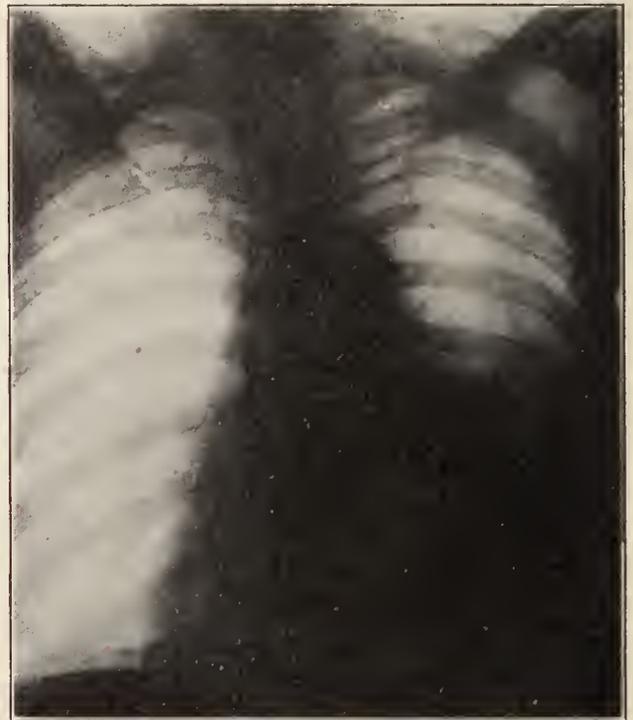


FIG. 3.—X ray picture taken March 17th, six days after removal of fluid.

second pulmonic, but no murmurs were heard. Blood pressure was 120 mm. systolic and 80 mm. diastolic. Abdominal examination was negative. Splenic dullness was displaced downwards and the edge of the spleen was felt at the lower border of the left ribs. Physical examination was otherwise negative.

On the day of admission the left chest was aspirated and about eight ounces of cloudy straw colored fluid withdrawn. As the patient was very weak aspiration was discontinued then on account of distress to the patient. On the following day the left chest was again aspirated and about ten ounces of fluid of the same character removed. Aspiration had to be discontinued again because of the patient's weakness.

On March 8th the left chest was again aspirated and ten ounces of fluid withdrawn. On March 9th,

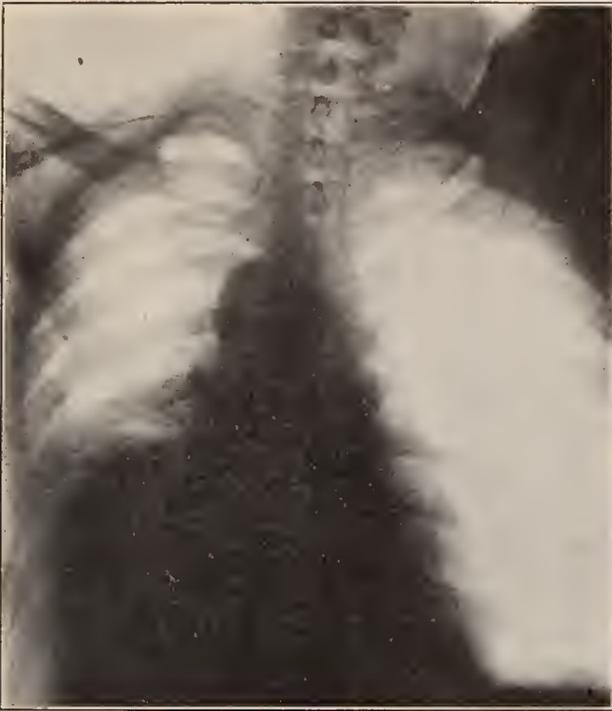


FIG. 4.—X ray picture taken March 29th, eighteen days after removal of fluid.

the patient seeming stronger, two quarts of fluid of the same general appearance were withdrawn by gravity. The patient stood this aspiration very well and asserted that he could breathe much easier. Fremitus and breath sounds were present after aspiration to about the angle of the scapula. Two days later, on March 11th, the physical condition of the left chest was practically the same as it had been two days before, previous to aspiration.

An x ray picture of the chest was taken (Fig. 1) and immediately afterward two quarts of serous fluid withdrawn. After withdrawal of this fluid the rubber tubing from an oxygen tank was fitted over the aspirating needle and the oxygen was allowed slowly and carefully to enter the left pleural cavity passing through the usual water bottle. The oxygen was introduced until the patient complained of distention and distress in the left chest. An x ray picture was taken immediately after the introduction of the oxygen (Fig. 2).

The patient then began to feel better, the dyspnea was not so pronounced, and breath sounds were heard, though distant, almost to the angle of the scapula. Later he was able to lie down in bed and slept easier, feeling fairly comfortable. From this time on the patient gradually gained in strength and after ten days was able to get out of bed and within two weeks he was up and about the ward almost the entire day feeling practically well. Motility of the chest had become almost equal on both sides. On the left side fremitus was present but faint; resonance normal to the sixth interspace posteriorly and from that point impaired. Respiratory sounds were practically normal down to the seventh rib but distant and faint over the base. No râles were heard over the left chest; over the right side resonance and harsh respiratory sounds were heard down to

the eleventh rib. Apex beat was now just inside the nipple line. Heart sounds were normal. Each day an x ray examination of the chest was made and the pictures showed increasing expansion of the left lung synchronous with the improvement in the patient's general condition (Figs. 3 and 4). On March 29th the second exposure was taken with the patient lying on his left side. He was discharged from the hospital practically well on April 14, 1921.

May 14th: The patient said, "I feel as good as I ever did except that my wind is not as good as it was." He was then working repairing streets for the Water Department of the city of Albany. Examination showed that expansion was practically equal on both sides of the chest. At the base of the left chest vocal fremitus was feeble, the percussion note impaired, and the respiratory sounds less distinct than normal, due to thickening of the pleura. The apex beat was just inside of the nipple line and the cardiac dullness on percussion did not extend beyond the right border of the sternum. The heart sounds were less loud than normal; the aortic louder than the pulmonic sound. Blood pressure systolic 140 mm., diastolic 90 mm.

LABORATORY EXAMINATIONS.

The urine was found to be acid, there was a faint trace of albumin, no sugar, and in the first two of four examinations some granular casts and a few pus cells were found. The blood: On entrance there was a leucocytosis of 19,500, polynuclears eighty per cent., lymphocytes twelve per cent., large mononuclears five per cent., transitional forms three per cent. On March 21st hemoglobin seventy per cent., red blood cells 3,600,000, white blood cells 12,200, polynuclears seventy-two per cent., lymphocytes twenty-six per cent., large mono-

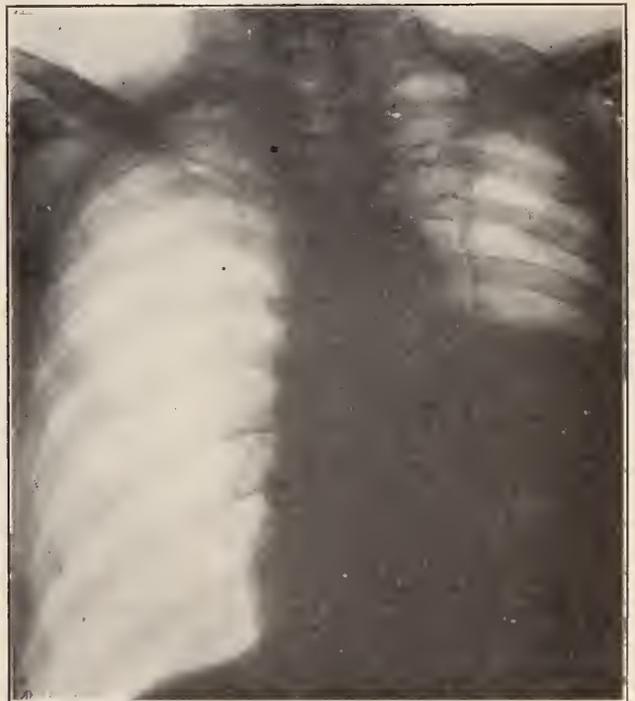


FIG. 5.—X ray picture taken March 29th, eighteen days after removal of fluid, patient lying on his left side.

nuclears one per cent. and eosinophiles one per cent. The sputum was negative on examinations made on six different days for tubercle bacilli. The temperature on admission was 100.6°, pulse 110, respirations 32. Temperature and pulse were somewhat irregular but never higher; on March 21st the temperature was normal and pulse and respiration only slightly above normal rate.

REPORT OF EXAMINATIONS OF EXUDATE BY BENDER
HYGIENIC LABORATORY.

Received March 11, 1921, ten c. c. of pleural fluid with fibrous clot. Smear showed a few lymphocytes. No bacteria present. No tubercle bacilli found. Culture of fluid yielded micrococcus pyogenes aureus. This organism, however, might be a contaminant, for the cytological examination did not suggest a pyogenic infection. Guinea pigs were inoculated. May 13, 1921. The guinea pigs inoculated on March 12, 1921, were killed on May 6th; no evidence of tuberculosis present. The guinea pig inoculated on March 12, 1921, was killed on May 12, 1921; no evidence of tuberculosis present.

CASE II.—In February, 1919, I had under my care a patient with tuberculosis and recurrent tuberculous pleurisy affecting the right side. After tapping him several times with recurrence of the fluid it occurred to me that oxygen which had seemed to act so well in tuberculous peritonitis might be of some advantage in tuberculous pleurisy. A rubber bag was filled with oxygen and brought to his home. After the fluid was removed the oxygen was forced into the pleural cavity. For ten days he apparently did exceedingly well and the physical signs seemed to indicate no marked reaccumulation of fluid. As the patient was confined to his home no x ray pictures of the chest were taken. On March 5th I was hurriedly summoned to the house with the message that the patient was suffering intense pain and great difficulty in breathing. Upon arriving at his home soon afterwards I found him dead.

The family gave their permission for an autopsy which was performed by Dr. Wolbach, then the director of the Bender Laboratory, Albany, N. Y. The anatomical diagnosis was thrombosis of the left pulmonary artery following thrombosis of the prostatic plexus, chronic pulmonary tuberculosis, and tuberculous pleuritis. The right lung and the upper portion of the pleural cavity were adherent over all surfaces by dense, fibrous adhesions to the chest wall. The base was concave and the remainder of the pleural cavity was filled with a slightly yellowish turbid liquid. Unfortunately the undertaker had been permitted to embalm the body before the autopsy was made.

It would seem from this first case, although appreciating that "one swallow does not make a summer," that the result would justify further trials in injecting oxygen into the pleural cavity in cases of recurrent pleurisy not yielding to aspiration. This is so easily carried out and without danger, especially if a manometer, such as is used for artificial pneumothorax, was employed and the quantity of gas injected thus accurately determined. This method might also be tried in cases of pneumococcus empyema where aspiration alone has at times been able to

effect a recovery. Whether it should be attempted in simple pleurisy with effusion without waiting for the result of the first aspiration is a question. Probably in more than eighty per cent. of cases with effusion recovery takes place after the first aspiration. In many of these cases, however, the lung may be damaged by adhesions. The injection of oxygen would prevent the formation of the adhesions by the separation of the pleural layers and would apparently prevent the reformation of the fluid in the fraction of cases in which that condition was likely to occur. The fact that almost all cases of pleurisy with effusion are tuberculous would suggest that even the temporary immobility of the lung which thus follows might be of some value in the pulmonary condition.

Whether oxygen, air, or nitrogen should be used as the gas for injection into the pleural cavity might easily be made the subject of investigation. It is known that oxygen plays a vital part, not only in the human organism but also throughout Nature, and is the essential constituent of air and water. It is also an element which apparently frees the body from all refuse and surplus material. It might well be that there is a chemical equilibrium of the body in which there is a mutual reaction of oxidation and reduction, and that disease in some way throws the organism out of this chemical equilibrium making it thus more susceptible to pathogenic processes. If an organ in the early stages of disease is supplied with oxygen which might counteract this pathological condition and restore at that point chemical equilibrium, the organism might be able to overcome the disease by this restoration of normal chemical conditions.

Oxygen, too, is easily available in all hospitals and very readily carried to private houses. Any value which air itself would have is probably due to the oxygen which is contained in that air. The only value which nitrogen would seem to have over oxygen is the fact that its absorption is not so rapid by the tissues as that of oxygen and therefore as a result of its introduction into the pleural cavity the immobility of the lung continues for a longer period. Whether this advantage is greater than the oxidizing influence of oxygen might also be determined by future investigations.

My belief twelve years ago was that this method of treatment of pleurisy had not been used before and the unfortunate result, not due, however, in the slightest degree to the method of treatment, in my first case precluded any report of the same. After the very successful result in the second case I find on looking carefully over the literature that the adage of Solomon that "there is nothing new under the sun" is again exemplified. Sir James Barr, of Liverpool, more than twenty years ago treated cases of pleurisy by the injection of gas. Some of the French and Italian clinicians have also carried out this same line of treatment and in the *Nelson Loose-Leaf Medicine*, Sergeant under treatment of pleurisy recommends this method of treatment.

There is no record of its use for this purpose in the United States, so far as I have been able to ascertain.

274 STATE STREET.

The Rôle Played by Physical Exercise in Respiratory Gymnastics

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Lefebvre states in his interesting work on *Physical Education in Sweden* that one of the fundamental principles in educative gymnastics demands that all gymnastic exercises should allow and be accompanied as far as possible by complete and free respiration, not only on account of the thoracic development resulting from it, but also because muscles require more oxygen and throw off more waste products during activity than when they are at rest. For this reason respiratory exercises form an essential part of Ling's method of Swedish gymnastics.

This observation of the Belgian author emphasizes the importance of respiratory exercise in physical education, an opinion which agrees with the views of my friend Rosenthal, when he says, in his report to the International Congress of Physical Education, that physical education can only be given to subjects who know how to breathe, and also when he asserts that "a regular functioning of the viscera must necessarily precede muscular training and the practice of sports."

It appears that the necessity of learning to breathe properly has occupied the attention of mankind for a long time, for the Chinese three thousand years before the Christian era established a method of respiratory gymnastics in Cong-Fou, their system of gymnastics. According to this method three varieties of breathing were taught: First, inspiration and expiration through the mouth; secondly, inspiration and expiration through the nose, and thirdly, inspiration through the nose and expiration through the mouth. The Chinese teachers were convinced that in this manner an equilibrium was effected between atmospheric pressure and the circulation, or, as they express it, "between the pressure of the atmosphere, the blood, the humors, and the resistance caused by the force of gravity."

Later on, the Brahmans employed retention of the breath, according to the rules of Manon, which is a respiratory exercise designed to increase the warmth of the interior of the body, augment the capacity of the chest, strengthen the respiratory organs, purify the lungs from their impurities, and enlarge the pores of the skin, thus permitting of more intensive transpiration. They stated that the respiratory movements purified the mouth, pharynx, chest, stomach and intestines, and counteracted yawning, hic-cough, cough, asthma, gastritis, and enteritis.

The Greeks and Romans made use of respiratory exercises to regulate the respiration of their athletes during physical training. Among these exercises they differentiated two varieties of movements, those planned to exercise the upper part of the chest, and others for the lower part. Inspiration began with a slow movement of short duration, becoming progressively more vigorous and prolonged; expiration which closed the exercise, was also gradually pro-

longed, though to a lesser extent. In order to improve the execution of these exercises chest and abdomen were compressed, according to Oribase, by means of a cloth in the form of a belt. Galien distinguished even four varieties of retention of the breath, according to the behavior of the abdominal muscles, which were either in a state of mild tension, or relaxed or at rest, or under the same degree of tension as the diaphragm, or strongly contracted with the diaphragm relaxed.

The gymnastic method of Ling has brought about a considerable modification in respiratory training through rational development of those muscles which govern respiratory movements. This method has demonstrated that by appropriate muscular exercises we obtain not only an increase in the synergy of the contractions of thoracic and spinal muscles, but also a regularization of the respiratory rhythm, and thus a greater expansion of the thorax, which is characteristic of normal inspiration, properly carried out.

Now one can easily understand why respiratory exercises have found a constant place in the Swedish program of physical education. If carried out regularly and in a correct manner, respiratory exercises become a reliable means of preventing muscular fatigue during the different physical exercises, and, on the other hand, they prepare the muscles for other more strenuous exercises, such as sports and fights. We can, therefore, affirm that respiratory exercises are at the same time creating and stimulating muscular force in physical education. They increase the respiratory area, permit the introduction of a greater quantity of oxygen and thus bring about a more perfect oxygenation of the blood in the pulmonary capillaries. But in order that these respiratory exercises may be able to perform their rôle of stimulants to muscular force, it is necessary that they conform to physiological principles, according to Rosenthal, and with rhythmic principles according to Vuillemin. They must be voluntary and, according to Guermontprez, carried out methodically and with persistence.

In examining respiration from the anatomical and physiological points of view, one finds that it is regulated by two different muscular groups, the inspiratory and the expiratory muscles. These two muscular groups contract periodically according to their inherent function, and, on account of the law of antagonism, they create the respiratory rhythm, which is so necessary for the constant exchanges of the fundamental constituents of our respiration. From this it necessarily follows that the respiratory function itself depends upon the harmony of the antagonistic action of these two muscular groups and of their rational training. Physiologists have already noted that of the two periods of ordinary respiration, inspiration alone is an active process

and required only few muscular contractions, and often none at all, for expiration is only a simple return of the thoracic organs to their original state, and expiratory muscles become active only during deep or forced respiration. In this way, whatever the amplitude of respiration, the inspiratory muscles are required in order to dilate the thorax and to cause the entry of fresh air. Thus the work of the inspiratory muscles is an active function. According to physiologists, the respiratory muscles may be grouped from a physiological point of view in the following manner:

1. *In ordinary inspiration.*—The inspiratory muscles thrown into action are the diaphragm, the scalenes, and the intercostal muscles.

2. *In deep or forced inspiration.*—The inspiratory muscles are divided into three categories: those of the trunk and neck; the sternocleidomastoid, the trapezius, the rhomboids, the latissimus dorsi, the serratus posterior, the serratus magnus, the spinal muscles, and the pectoralis minor. Those of the face: the dilator nasi and alae nasi muscles, and the dilators of the palpebral and oral orifices; finally, those of the larynx: the sternohyoid, the sternothyroid, the posterior cricoarytenoid, and the thyroarytenoid.

3. *In ordinary expiration.*—The action of the expiratory muscles is passive, the thorax returning to the starting point.

4. *In deep or forced expiration.*—Here we find on the contrary the muscles of the abdominal wall, the triangularis sterni, the serratus posterior inferior, and the quadratus lumborum.

Thus inspiration, and especially deep inspiration, requires a far greater number of muscles than forced expiration, for in deep inspiration the lungs attain their maximum development. So great is their importance for respiration that without judicious training the vital function of our very existence experiences a notable deficiency.

Now by what means could the inspiratory muscles be rendered more efficient, if not by the educational exercises of gymnastics? It is evident that only rational physical exercises can efficiently train the contractions of these muscles and endow them with the force necessary to increase the dimensions of the thorax and thus also the respiratory capacity. The impressive list of respiratory muscles given above suffices in itself to demonstrate once more the important part played by educational exercises in respiratory gymnastics. It also proves that without appropriate training of these muscles respiration cannot be educated in a rational manner.

Among these muscles some occupy a preponderant position on account of their anatomical situation, such as the diaphragm, the intercostal muscles, the serrati, and the rhomboids. But in respiratory gymnastics all muscles participate equally in the establishment of the respiratory function. If it is desired to evolve an effective training of the muscles of respiration, one is, therefore, forced to exercise them all together by appropriate and progressive movements. Those exercises which permit the attainment of this aim, form part of the method of educational gymnastics, and every practitioner of physiotherapeutics possesses the means of utilizing them according to his own scientific conception.

One need only take into account the anatomical distribution of inspiratory and expiratory muscles and their physiological action in the process of respiration in order to institute corresponding exercises aimed at obtaining synergic and coordinated action of these muscles.

It is quite erroneous to presume that physical education of the two antagonistic groups of respiratory muscles results from forced overaction of the expirators, as brought about in exercises with spirometers. Such exercises increase the muscular tonicity of the expiratory muscles at the cost of the inspiratory muscles. They neglect the very principle of that harmony which must always reign between the two chief groups of respiratory muscles. Further, they fail to take into consideration the predominant action of the inspiratory muscles and they merely bring about a respiration which, if not actually wrong, is certainly incomplete. Without describing the error of suppressing nasal respiration we would point out that spirometry effects a faulty training of the expirators and transforms ordinary passive expiration into forced expiration; for, once the expirators have established the habit of dominating the inspiratory muscles, they will function actively even when they should remain at rest. However ingenious the construction of spirometers, I am of the opinion that these instruments are only a means of control and represent neither a method of education nor of reeducation of the respiratory function. Alone, physical exercises of the muscles constitute the outfit for gymnastic respiratory movements; spirometers can only serve to control the results obtained. However, since the respiratory act comprises yet other organs in addition to the lungs, nose and larynx, it is therefore necessary, for the perfect training of respiration, to secure equal participation of the muscles cited above, which effect the movement of air through nose and larynx. To this end song and recitation may render useful services. However, it would be a serious error to pretend that singing alone sufficed to develop the respiratory function. Laryngologists, especially those experienced in the treatment of singers, realize clearly the important rôle played by physical exercises. In order to combat faulty breathing in singers, Dr. Marchal de Calvi in 1854 insisted on exercises composed of movements of the arms, shoulders, trunk, etc., followed by respiratory exercises consisting of twenty to thirty slow and deep respirations two or three times a day.

The physical exercises which we utilize in respiratory gymnastics follow closely those described by Prof. Guermonprez, Desfosses, Santon, Lefebvre, Vuillemin, Lagrange, Gommaert, and Gunzbourg, and the military regulations on gymnastic instruction, and also Labouré and many other authors who have investigated the physical education of respiration. The methods employed by all these observers are similar in their outlines, they only differ in the intensity and duration of some exercises, and also in the personal preferences of each author for certain movements. This explains to a certain degree why we do not possess a single method of respiratory gymnastics; and also why these methods, while appearing to differ with each author, yet represent

in principle the same physical exercises aiming at the same results. Just as educational exercises are carried out with the participation of the will of the individual, so respiratory gymnastics must equally be willed, all the more so since we are dealing with one of the vital functions of our life.

To sum up our conclusions in a few words: First of all, if respiratory exercises are indispensable for the profitable execution of the exercises of physical education, then they assume a preponderating rôle in respiratory gymnastics, in fact they constitute their basis. Further, of the two phases of respiration, inspiration is the active mode and is accomplished by means of a powerful group of muscles, the action of which can only be trained by a series of rational physical exercises. Their aim is to enlarge the thorax and, consequently, to increase

the supply of oxygen which is indispensable for the metabolism of our body. Finally, since inspired air must be approximately at body temperature, it is necessary that the air should enter through the nose and without the intermediation of any form of apparatus. With regard to spirometers, it has been shown that they can only serve to control the results obtained, but they can in no way be used for respiratory education. The latter can only be achieved when by conscious effort those muscles are trained which govern the respiratory function. Respiratory exercises, therefore, must be voluntary; further, they must bring about deep inspiration, and, finally, they must be nasal in nature. These three principles constitute the basis of all respiratory gymnastics.

32 RUE DE LIEGE.

Aspergillosis and Pulmonary Pseudotuberculosis

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Diseases caused by parasitic and pathogenic phytomyces have seldom received the attention that they really deserve. With the exception of blastomycosis, which has been very extensively studied, especially in America (1), the diseases caused by other fungi have received scant attention. This is no doubt due to their comparative rarity, although this rarity is in no small degree dependent on the nonrecognition of these infections. It is the purpose of this contribution to treat of the lesions caused by fungi of the genus aspergillus.

Hyphomycetes are closely related to the higher algæ. Phylogenetically they belong to the order that have lost their chlorophyl, thus being obliged to lead a saprophytic and parasitic mode of life. Reproduction is usually asexual, although occasionally sex conjugation seems to be necessary to insure the stability of the different species of aspergillus.

Aspergillus malignus has been found often in the ear of man causing a persistent and painful otitis with loss of hearing. The Aspergillus pictor is found as the cause of certain chronic skin diseases that are very common in South America. Aspergillus fumigatus is the one species we are mainly concerned with, since it is equally diffused throughout the world. It produces a typical pseudotuberculosis in animals and man. The lesions produced by it closely resemble those of fibroid tuberculosis. Renon (2) who has studied the subject very extensively, finds that the disease is often transmitted to man from pigeons and parrots, since the disease is exceptionally common in pigeon crammers. The disease is also common in hair combers, who use rye flour to remove grease from the hair.

ASPERGILLAR PSEUDOTUBERCULOSIS.

In its pathogenicity the Aspergillus fumigatus resembles very closely the Bacillus tuberculosis. The histological lesions caused by it in all tissues closely resemble the typical tubercle. Greggio (3) who has

made a most exhaustive study of aspergillosis and whose histological researches are undoubtedly the most complete, has shown that both in histological picture and clinical course, the disease closely resembles tuberculosis. This particularly is true when pulmonary tissue is involved.

The cases of pulmonary aspergillosis that have come under my observation so typically resemble tuberculosis that each one had been diagnosed and treated as such. The very basis for this contribution rests in the fact that these cases of aspergillosis quickly respond to treatment. When untreated they become progressively worse and, terminally, are often associated with tuberculosis. The tuberculous infection supervenes secondarily and is much favored both by the systemic and local lowering of resistance, due to the aspergillus and its toxin. It is evident that it is of great importance to diagnose these cases of aspergillosis before the supervening of tuberculosis, and when treatment ordinarily results in clinical cures.

DESCRIPTION OF THE PARASITES.

Aspergillus fumigatus grows readily on all laboratory media, and especially well upon potato and bread. For its study, Raulin's medium is to be preferred. In our own investigations, we have found a solid medium containing all the elements of the Raulin liquid to be preferable. The medium is prepared according to the following formula:

	Grams
Water	1500
Saccharose	70
Tartaric acid	4
Ammonium nitrate	4
Ammonium phosphate	0.6
Potassium carbonate	0.6
Magnesium carbonate	0.4
Ammonium sulphate	0.25
Zinc sulphate	0.07
Iron sulphate	0.07
Potassium citrate	0.07
Agar-agar	18

Generally after the third day colonies appear as white stellate or round points which rapidly increase

in circumference. Soon a greenish color appears throughout the culture and in ten to twelve days it takes on a smoky appearance. The mycelium is well defined and it appears on culture as a dense velvety mass.

The fructification heads are crowned with sterig-



FIG. 1.—Cultures of *Aspergillus fumigatus*, seven days old.

mata which are surrounded with spores. The spores are about three microns in size, many of them being considerably smaller. The average size of the fructification head is from twenty to thirty microns and that of the hyphæ about fifteen microns. The spores

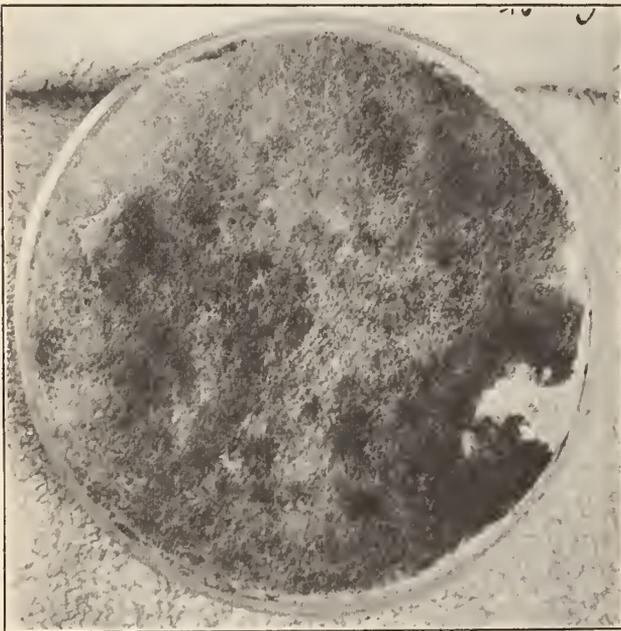


FIG. 2.—Cultures of *Aspergillus fumigatus*, ten days old.

are gram positive, but the hyphæ and the mycelium are distinctly negative.

The importance of carefully examining the sputum for aspergillus is obvious. In the routine ex-

amination for *Bacillus tuberculosis* the presence of the *Aspergillus fumigatus* will often escape detection. We advise a separate examination made by treating some of the thick portion of the sputum with a ten per cent. solution of sodium hydroxide for three minutes. A smear is then made and examined wet under the one sixth objective.

The hyphæ and mycelium and fructification heads can often be easily found. The thin smears, after heat fixation, can be stained by Gram's method and examined with oil immersion with one twelfth objective, for finer study. In the presence of negative findings at investigation, cultural examinations are advised, as sometimes the sputum will only contain the spores.

SYMPTOMATOLOGY OF ASPERGILLOSIS.

The symptomatology of this disease varies from that of acute mycoid bronchopneumonia to that of the chronic tuberculosis. In this chronic type the symptoms are a close parallel to tuberculosis. There is emaciation, mild night fever, with sweat, cough, etc. In nearly every case there is at times some

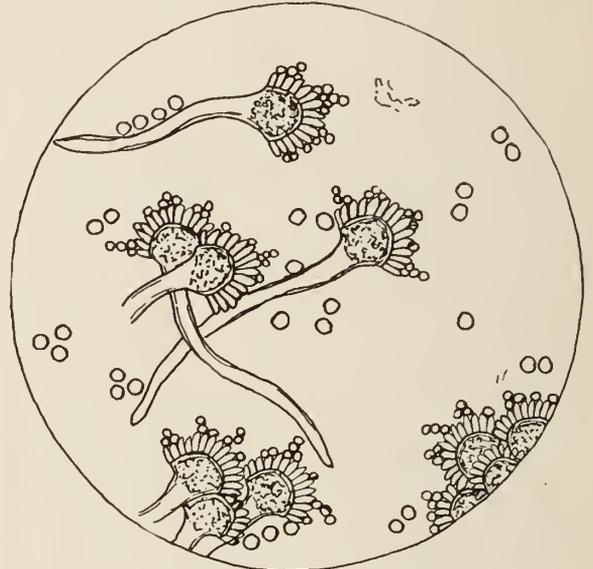


FIG. 3.—Appearance of parasite under one twelfth oil immersion objective.

bloody sputum. If an ulcerative process of sufficient size is established, large pulmonary hemorrhages can result, as in the ulcerative type of phthisis.

This parasite can also give rise to a very acute type of bronchopneumonia. The patient exhibits all the signs of a grave infection. The prostration is far more grave than in any other type of bronchopneumonia. This is entirely due to the aspergillus toxin, which causes the phenomenon in animals. Cecci and Besta (4) isolated a thermostable toxin from the aspergillus, which was not destroyed until subjected to a temperature of 120° C. The inoculation of this toxin in suitable laboratory animals, especially rabbits, dogs and guineapigs, produced severe prostration and tetanic and paralytic convulsions. If the dose is large enough it causes death within a few hours.

TREATMENT.

The necessity of early diagnosis of pulmonary aspergilliosis is evident from the fact that, in the

absence of complications from concomitant tuberculosis, the disease can be rapidly cured by appropriate treatment. The importance of eradicating an infection of this type cannot be overestimated, since its continuation usually leads to tuberculosis.

Iodine seems to be specifically destructive to the life of the aspergillus. It undoubtedly also serves to cause absorption of the infiltration caused by the infection. We have employed it in the form of the iodides of potassium and sodium, by mouth and by intravenous injection. For the intravenous treatment, sodium iodide, in doses of one or two grams, in twenty-five c. c. of saline solution (properly sterilized and filtered) is recommended. Proper hygienic measures should not be neglected and absolute rest from work is essential. The nutrition of the patient must be encouraged and such treatments as may be demanded by symptoms (cough, anemia, emaciation, etc.) should not be neglected.

Under the administration of the iodides, in the cases we have treated, the infection has cleared up in the course of four or five weeks. Of five patients treated three have remained well for over two years. In the remaining two there have been recurrences after a few months. One of these cases was complicated by tuberculosis. This patient had a recurrence in about eight months after the aspergillus had disappeared from sputum. He responded to treatment quickly and gained about thirty-five pounds. Tubercle bacilli were present in his sputum in large numbers at the time that he came under observation for the aspergillosis. No bacilli whatever have been found for nearly a year. The effect on his tuberculous infection must have resulted from the general amelioration of his health with enhanced immunity,

as the treatment could not have specifically combated the tuberculosis. The other recurrent case, which was uncomplicated by tuberculosis, seemed to be resistant to treatment, as the patient had three recurrences in one year in spite of energetic iodide therapy. The resistance of the infection led us to use, in addition to iodide therapy, a saline extract of aspergillus culture. With the use of this agent, in addition to iodides, the patient improved very rapidly. The parasite had not reappeared in the sputum and there was no recurrence of symptoms at the time of last observations, nine months after treatment. No opinion is offered as to the therapeutic value of an antigen prepared from the aspergillus culture, since the result obtained in this case may have been entirely due to the energetic iodide therapy.

The early recognition and treatment of this infection, which is not as rare as usually believed, is of great importance in its relationship to tuberculosis. The necessity of sputum examinations in all suspicious cases for the detection of the *Aspergillus fumigatus* is therefore obvious.

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Practical Points in the Treatment of Pulmonary Hemorrhage*

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Of the symptoms of pulmonary tuberculosis there is none more alarming to the patient, his family, and occasionally to the practitioner, than a severe hemorrhage. The presence of even small amounts of blood in the expectoration, particularly for the first time, is frequently sufficient to arouse the wildest fears. The time honored treatment, which I shall describe presently, is such as to intensify the fear of impending doom. However, in spite of the formidable picture presented by a severe hemoptysis and the large amounts of blood sometimes lost by the patient, it is rarely the immediate cause of death, probably not more than one in a thousand deaths from the disease being caused by this complication.

Although hemoptysis may be due to a great variety of causes pulmonary tuberculosis is its most frequent one. It may be the first symptom to call attention to the presence of a hitherto unsuspected

tuberculous lesion and in one to which the majority of the tuberculous are subject at one time or another in the course of the disease, apparently without regard to the duration, nature and extent of the lesion and independently of subjective symptoms.

In the progression of a tuberculous lesion from infiltration to necrosis and liquefaction the vessels undergo an obliterating endarteritis. Otherwise hemoptysis would be more frequent and more severe. In some cases, however, the processes of caseation and liquefaction go on so rapidly that rupture due to the breaking down of a tubercle in the vessel wall occurs before it undergoes thrombosis, and bleeding of varying intensity takes place with the expulsion of necrotic tissue.

In other cases the vessels resist the necrotic process and with the destruction of pulmonary tissue remain as patulous vessels traversing, or running along the walls of a cavity. The support of the pulmonary tissue removed they may undergo

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aneurysmal dilatation and rupture and thus become the most frequent cause of severe, profuse and occasionally fatal hemorrhage. Slight and sometimes prolonged bleeding may result from an exudative inflammation or collateral hyperemia, or from minute oozing vessels in the cavity wall.

The amount of the bleeding depends on the size of the vessel involved and the extent of the rupture in its wall. It may begin with very small quantities of pure blood or intimately mixed with sputum, or with streaks or specks of blood to be followed shortly or within varying periods by severe and profuse hemoptysis. It may be ushered in suddenly with large amounts coming up into the mouth as fast as the patient can expectorate, in severe cases overflowing the bronchial tree and sometimes causing immediate death by drowning. In very weak, cachectic patients without strength to expel the blood by coughing it may trickle down the throat and cause death by suffocation without much outward evidence of severe hemorrhage.

Systematic writers have classified hemorrhage into several types based upon the underlying pathological process. From the viewpoint of treatment such a differentiation is quite impracticable and of no importance; neither is the recognition of the extent and character of the lesion which it is anyhow inexpedient to determine by physical examination until the likelihood of recurrence of the bleeding has subsided, unless it is for the urgent purpose of collapsing the offending lung by artificial pneumothorax.

The mildness of onset is not an indication of the course the hemorrhage is likely to pursue, hence even slight blood spitting should be looked upon as a danger signal. The bleeding may check itself promptly by the formation of a clot and repair of the ruptured vessel wall. There may be a temporary cessation followed by recurrences as a result of repeated dislodgments of the clot. The expectoration of clots or bloodstained sputum may persist for an indefinite period after the active hemorrhage has stopped, or it may continue for days and even weeks with gradual exhaustion of the patient and the onset of complications leading to exitus.

We have been taught that the determining influences in the causation of hemorrhage are one or another form of physical and even mental overexertion, trauma, excessive laughter and even sneezing, coughing, high blood pressure, increased amount of fluid in the body, and atmospheric conditions. A careful analysis regarding exercise preceding the onset of hemorrhage shows that there is very little, if any, connection between everyday physical exertion and hemoptysis. The greatest proportion of hemorrhages have their onset while the patient has been at more or less complete rest and even during profound sleep or after negligible body movements. Excessive cough and similar respiratory exertions which increase the intrapulmonary pressure are the most important factors in determining the onset of hemoptysis.

Premonitory subjective symptoms are, as a rule, entirely absent. Some patients complain of pain and oppression in the chest before the onset of hemoptysis. Objectively, there is frequently in-

creased activity with signs of breaking down of the lesion.

Taking up the more immediate subject of this paper, the management and treatment of hemorrhage it must be admitted that we have made little progress in this direction. The therapeutics of this complication is still based largely upon unsystematized and haphazard clinical observations and theoretical conceptions, judging by what one reads in the literature and sees in practice.

Since cessation of hemorrhage results from the formation of a clot in the ruptured vessel wall and its organization, the indications for treatment consist primarily in controlling all factors which would tend to dislodge the clot. This we seek to accomplish by lowering the pulmonary blood pressure, preventing its increase, and by increasing the coagulability of the blood. Further indications are to prevent asphyxia by the aspiration of large quantities of blood and by insufficient expectoration, to guard against syncope and shock and to prevent such complications as atelectasis and aspiration pneumonia.

The treatment most usually exhibited in private practice is the classical immobilization treatment. The patient is placed flat on his back without a pillow and occasionally with the foot of the bed or the lower extremities raised. He is warned against changing this position, forbidden to turn his head or lift a finger. He is directed not to speak at all or not above a whisper. He is doled out numerous drugs, singly, in combination or in rotation. Food is administered in homeopathic doses for fear that the efforts of mastication and swallowing will increase or renew the bleeding. More frequently he is starved for days. We frequently find the patient in a pool of blood with the blood soaked clothes not removed or changed for fear of dire consequences. He is occasionally kept flat on his back not only during the period of active bleeding but for weeks thereafter.

The picture presented by a patient under this régime of hysterical fear is a truly deplorable and gloomy one. The treatment is based upon time honored, erroneous theories of the effect of ordinary body movements and respiratory excursions upon the systemic and pulmonary blood pressures.

According to our present physiological knowledge there is no basis for assuming that the moderate body movements of everyday life have any influence in raising the pulmonary blood pressure so as to promote hemorrhage. This is particularly true of such movements as are likely to be undertaken by a patient during active hemoptysis even without medical instruction. Even if it is admitted that ordinary body movements increase the systemic pressure it has been shown conclusively that the two circulations are relatively independent and that considerable variations in pressure in the systemic have only a slight or no effect upon the pressure in the pulmonary circulation.

We do not believe that complete immobilization is necessary and that it serves to lessen the bleeding or to prevent its recurrence. As a matter of fact it increases the danger of some of the more serious complications.

While the bleeding is active the patient should of course not be permitted any undue exertion. The clothing, however, may be carefully removed and the patient placed comfortably in bed, preferably in a semirecumbent position. The flat-on-the-back position may be indicated in cases with symptoms of cerebral anemia and collapse due to exsanguination. In the usual case the semirecumbent or even sitting position relieves the cough, facilitates raising the blood with the least amount of expulsive effort and the administration of medicaments and nourishment, and is less distressing to the patient physically and mentally. After the active bleeding has stopped the patient may be permitted more and more freedom of movement. Rest in bed should be continued for eight days or longer, depending upon the severity of the hemorrhage, after the complete disappearance of blood stained sputum. In some cases of long continued blood spitting after a hemorrhage it is surprising how promptly it disappears on getting the patient out of bed.

Another tradition in the treatment of pulmonary hemorrhage that should be completely discarded along with the strict immobilization treatment is the use of morphine. The indication for allaying excessive cough, which is of directly harmful influence by raising pulmonary blood pressure and increasing respiratory excursions and thus preventing the formation and organization of the clot in the ruptured vessel wall, and which is the only excuse for using any narcotics, should be met by drugs which do not prevent the patient from relieving himself of the accumulating blood and pulmonary secretions. Codeine, heroin and dionin are just as effective and do not interfere with free and easy expectoration. There is no physiological basis for assuming that morphine except in excessive doses lowers the pulmonary blood pressure.

Strict immobilization and the indiscriminate use of morphine are the principal causes of hypostatic congestion, atelectasis and bronchopneumonia, complications more serious than the hemorrhage itself. If the patient is nervous and restless the bromides, which in addition to their sedative effect probably increase the coagulability of the blood, may be employed.

What shall we say of the ice bag which often leaks and chills the patient, and of the swallowing of ice? The effect of the first is supposed to be a lessening of the excited heart activity, if applied over the precordium and of some hypothetical influence on the hemorrhage itself if placed on that part of the chest which corresponds to the bleeding area. As a matter of fact it is extremely doubtful that it serves any purpose other than to immobilize the patient. That the application of cold in this manner can have any effect whatsoever either directly or indirectly on the bleeding vessel is mere unfounded conjecture. The internal administration of ice may serve to relieve thirst after the loss of excessive amounts of blood. If taken in excess, as is so frequently the case, it produces unpleasant gastric disturbances. It has been shown that irritation of the gastric and intestinal mucosa by cold produces a reflex dilatation of the pulmonary vessels. If so the ice would be rather contraindicated.

DRUGS.

The number of drugs which have been recommended from time to time for the control of pulmonary hemorrhage is legion. There is hardly one that is highly praised by one authority that is not condemned by another as either of no value or as distinctly harmful. At the Montefiore Hospital every rational drug therapy has been applied at one time or another and discarded. We are still in search of a drug which would have an unmistakable effect in stopping hemorrhage.

The use of practically all of these remedies is based largely upon unfounded claims of their effect upon the pulmonary blood pressure and on the coagulability of the blood.

One of the oldest remedies is table salt. All that may be said is that it is as efficacious as any other and much less harmful than a great many. It is given in doses of one to three drams five or six times a day during the period of active bleeding, preferably dissolved in water and administered through a drinking tube, the opening of which is placed as far back on the tongue as possible without causing gagging. It may also be given intravenously with good results in the form of a ten per cent. warm hypotonic solution in doses of two to ten c.c. The addition of two hundredths of one per cent. solution of calcium chloride is supposed to increase its efficacy. Care must be taken not to inject any of the solution into the subcutaneous tissue, since even a drop will cause severe pain. Sodium bromide in doses of thirty grains three times a day may be given instead of the salt, particularly if a sedative is indicated. Salt undoubtedly increases the coagulability of the blood temporarily.

Ergot and digitalis raise the pulmonary pressure and adrenalin has a strongly stimulating effect on the heart; they are therefore distinctly harmful. Amyl nitrite, extensively used in the past and still recommended along with some other useless or harmful drugs in our textbooks, has no longer a rational place in the treatment of hemoptysis, since it has been definitely shown that it raises the pulmonary pressure, though it lowers the systemic. In view of the fact that in the majority of cases of chronic phthisis the blood pressure is low one wonders at the rationale of the administration of drugs tending to lower it still more, and particularly since it is fairly certain that blood pressure is without influence on the frequency and intensity of hemoptysis.

Lead acetate, stypticin, calcium chloride and gelatin are harmless but without any therapeutic value. The inhalation of chloroform has been said to be the most effective agent for lowering pulmonary blood pressure but has gained no recognition. Defibrinated horse serum or that of some other animal including the human to increase the coagulability of the blood is still quite frequently used in private practice but has absolutely no value.

Emetine hydrochloride hypodermically in doses of one half to three quarters gr. in one c.c. of water has been highly recommended of late. In some cases it acts rapidly. It is especially useful in cases not far advanced. In weak patients with low blood pressure the smaller, in those with a pressure over

130 the larger doses should be used. In severe cases two or three injections may be given. The effect is probably due to lessening of pulmonary congestion.

More recently camphor in oil has been recommended. We give it subcutaneously (in the outer aspect of the thigh) in doses of three c.c. of a twenty per cent. or ten c.c. of a ten per cent. solution. In what way it produces its effects is problematical. At Montefiore Hospital we have tried it and found it wanting. Some patients react unfavorably to camphor with vomiting, cramps, headache and syncope. This occurs particularly in hysterical and fever cases.

Tying the extremities is another old remedy, little employed at present but well worth trying in severe and uncontrollable hemorrhage. The extremities are rapidly bandaged, taking care that the pulse remains palpable and that not too much discomfort is caused. The effect is probably the result of changes in the osmotic relations of the body by abstraction of fluids from the tissues and with it of thrombokinase from the parenchyma into the blood, causing an increased coagulability and also a decrease of the pulmonary blood pressure.

Some of the more unusual methods proposed have been venesection, sandbags applied to the bleeding side, strapping it with adhesive plaster, leeches applied to the buttocks. Extract of blood platelets, defibrinated exudates occurring in tuberculous peritonitis and pleuritis, pituitary extract, splenic and hepatic extracts, tannate of quinine, nauseating doses of ipecac, tartar emetic, pantopon and a great many of the other drugs of the pharmacopœia have been put forward as panaceas for hemoptysis. It is needless to say that all of them are either entirely useless or distinctly harmful.

The most efficacious treatment in severe hemoptysis is undoubtedly the artificial collapse of the bleeding lung by inducing a pneumothorax, provided we are successful in finding a lung sufficiently free from adhesions to permit of collapse or at least of that part which is the source of the bleeding and most important of all if we can determine with certainty the bleeding side. This is not always definitely possible.

The diet in severe cases should be carefully regulated. The frequent practice of permitting no food for days only weakens the patient. There is every reason for a hemorrhage patient to receive nourishment. Solids should be interdicted and the intake of fluids restricted during active bleeding. The nourishment should be neither hot nor ice cold but lukewarm and should consist of soft, semiliquid foods such as milk in small quantities, cereals, soft boiled eggs, jellies and gelatins. No effort should be made to move the bowels for a few days after the active hemorrhage has ceased. Later mild laxatives may be administered.

SUMMARY.

The rational treatment of hemorrhage should be based upon the following:

1. No matter how severe the bleeding it is rarely immediately fatal.

2. The great majority of hemorrhages are self-limited through the inherent tendency of the organism to effect a spontaneous control by changes in blood pressure, by increase in the coagulability of the blood, by contraction of vessels and by thrombus formation.

3. The undisturbed forces of nature are more effective and less harmful in controlling the bleeding than any drug therapy.

4. The classical immobilization treatment and the use of morphine do a great deal more harm than good and are the causes of complications more dangerous than an untreated hemorrhage.

5. There is no drug or other treatment except artificial pneumothorax that can be said to stop a hemorrhage.

6. The principal function of the physician is to reassure the patient, to allay mental excitement, to lessen excessive cough, to place the patient in a comfortable position at reasonable bodily rest and to avoid meddling therapy.

6. We are justified in employing those drugs and remedies which are known to have no harmful effects.

1215 MADISON AVENUE.

The Significance of Tracheobronchial Node Tuberculosis and Its Diagnosis

By LOUIS FRISCHMAN, M. D.,

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By way of introduction, let us consider the notable differences, clinically and pathologically, between pulmonary tuberculosis in children and in adults. In children and infants pulmonary tuberculosis is accompanied by enlargement and caseation of the intrapulmonary bronchial and tracheal lymph nodes. The lesion is not partial to the apices, but occurs almost with equal frequency in all the lobes; there is little tendency for encapsulation by

fibrous tissue, and cavitation is far less frequent than in adults. Dissemination of tubercle bacilli occurs frequently, with the setting up of processes in the meninges, spleen and other tissues. In adults, we find the point of predilection almost invariably in the apices, the disease tends to assume a chronic course, fibrous infiltration is quite frequent, and in advanced cases, cavitation is common. General dissemination from the lungs to the meninges, spleen,

or other organs is not common, except in the miliary type, or in the terminal stage of the disease. The usual method of healing in children is by calcification; in adults by fibrosis.

RELATION OF THE PULMONARY FOCUS TO THE LESIONS IN THE TRACHEOBRONCHIAL NODES.

Ghon has shown the almost constant association of pulmonary lesions in children with lesions of the tracheobronchial nodes. He concludes that the pulmonary focus is primary, and the lymphatic foci secondary, for the following reasons: First, gross tubercle in the tracheobronchial nodes is never observable unless gross tubercle is present in the lungs also. This is a rather sweeping statement, and needs further corroboration. Secondly, the changes in the lungs are always older than those in the nodes, e. g., the lesion in the lungs was frequently found at autopsy to be encapsulated, while the nodes showed a less advanced stage of progress. Allen Krause, however, believes that tracheobronchial node tuberculosis can precede the pulmonary lesion and even exist independently of the latter. With this end in view, he inoculated guineapigs with an attenuated strain of tubercle bacilli, and while the tracheobronchial glands became tuberculous, he found not the slightest evidence of tuberculosis in the lungs.

TUBERCULOSIS IN ADULTS.

Tuberculous lesions of the lungs may be separated into two sharply defined groups: First, apical lesions, which tend to spread diffusely through the tissues of the apex and are unaccompanied by caseation and calcification of the regional lymph nodes. This is the usual type of tuberculosis in adults. The second type may be designated pulmonary focal tuberculosis, for the lesion here is circumscribed, does not choose the apex as the particular point of attack, but the frequency with which it settles in the various lobes is in direct ratio to the volume of these lobes. Thus, in the right upper lobe it occurs with the greatest frequency, then in the right and left lower, then the left upper lobe, and least frequently in the right middle lobe, this being the smallest of all lobes. These lesions have the character and distribution of the circumscribed tuberculous lesions which appear after the second year of life. They rarely exceed one cm. in diameter. The smaller nodules of perhaps one mm. diameter are found only with great difficulty, even when they are calcified and cast a shadow on the x ray plate. Attention to these is directed by the rather conspicuous lesions in the lymph nodes, which may be found caseous or calcified. In children, freshly caseous focal lesions are predominant, whereas in adults the nodules are more frequently found to be encapsulated or calcified. Nearly half of these lesions are situated below the pleural surface, and fibrous adhesions are not uncommon. This type of tuberculosis is designated by Opie as focal tuberculosis. The incidence of focal tuberculosis increases after the second year of life, is frequently fatal in early childhood, but is rarely the cause of death after the tenth year. Few individuals at the age of eighteen have escaped this focal type of tuberculosis and ninety-two per cent. of all adults possess lesions of focal tuberculosis.

THE RELATIONSHIP OF PULMONARY TUBERCULOSIS TO TUBERCULOSIS OF THE REGIONAL LYMPH NODES.

When a localized focus of active or preexisting tuberculous infection is found in one of the lobes of the lungs, with few exceptions a similar lesion is to be found in the tracheobronchial nodes. The lesion of the lymphatic node is larger and more readily found than the pulmonary lesion, and frequently there is a chain of tuberculous nodes beginning in the lungs, and extending along the corresponding bronchus to one or the other side of the trachea. The tracheobronchial glands at the bifurcation of the trachea are first to be diseased, the gland adjoining the right bronchus being the most vulnerable. Infection in almost all who reach adult life commences in childhood, and the tracheobronchial nodes are usually first involved.

Tuberculous pulmonary lesions in adults are then of two types. First, apical tuberculosis, which is unaccompanied by caseation of the regional lymph nodes; second, focal tuberculosis which, as we have seen, is not particularly partial to the apex and is accompanied by caseation or calcification of the tracheobronchial nodes. Focal pulmonary tuberculosis of adults is identical with the tuberculosis of childhood; it occurs in ninety-two per cent. of all adults; it may be acquired between the ages of two and ten, but in more than fifty per cent. between ten and eighteen, while between the ages of eighteen and thirty, at least eighty-five per cent. of all individuals have acquired focal tuberculous lesions. This type exhibits the characteristics of a freshly infected process by the evidence of massive tuberculosis of the regional lymph nodes.

THE RELATION OF APICAL TUBERCULOSIS OF ADULTS TO FOCAL TUBERCULOSIS OF CHILDREN.

Apical lesions of the lung make their appearance in late childhood and occur with increasing frequency from adolescence to old age. After the tenth year focal lesions are almost invariably encapsulated, and latent or healed. Fatal tuberculosis after the tenth year is, with few exceptions, apical in origin. The apices are not only more susceptible later in life, but once infected afford less resistance to the extension of the lesion. Apical tuberculosis, in those who have previously acquired a focal lesion, pursues a chronic course, and in most instances becomes latent or healed. This suggests that apical cases which have not undergone a previous focal tuberculous infection may assume an unusually severe character. Apical tuberculosis in adults is not the result of juvenile tuberculosis, but is caused by a subsequent infection, since it does not have its greatest incidence in early adult life when focal infections acquired in childhood are fresh and relatively active, but is more common in later life, when the focal lesions have in most cases become healed by calcification.

It is held almost unanimously that the preponderating amount of focal tuberculosis occurring in childhood has its precursor in tracheobronchial lymph node tuberculosis. Having considered the part the tracheobronchial lymph nodes play in their relationship with pulmonary tuberculosis, we now come to the subject of diagnosis.

DIAGNOSIS OF TRACHEOBRONCHIAL NODE
TUBERCULOSIS.

The following subjective signs are commonly observed in the youthful victim: Anorexia, easy fatigue, lassitude, irregular elevation of temperature, and substernal pain, especially on deep breathing and exercise. Infants with enlarged tracheobronchial glands present a very marked stridor as the stenosis increases; it is an expiratory stridor. Cough ultimately sets in, and is paroxysmal in character and brassy, not as severe as the cough of pertussis, but suggestive of it. The cough is caused reflexly, by pressure of the enlarged gland on the vagus nerve. Constant pressure of the enlarged glands may cause erosion of the bronchi, esophagus or bloodvessels.

PHYSICAL SIGNS OF TRACHEOBRONCHIAL NODE
TUBERCULOSIS.

Inspection.—The child appears frail and puny, and anemic. The tuberculin reaction is positive. There are dilated veins over the anterior aspect of the thorax in fifty per cent. of the cases. The face may appear somewhat puffy. The expansion of the apices may be unequal. In some cases the thyroid cartilage instead of descending with each inspiration remains stationary (sign of de la Camp).

Palpation.—In some cases there is tenderness over the manubrium sterni. Tenderness is commonly

elicited by deep pressure over the upper dorsal spines. This is known as Petruschky's sign, and while no explanation thereof is available, it is of great assistance in the diagnosis.

Percussion.—The change in the percussion note at the paravertebral and vertebral lines is of doubtful value, inasmuch as it requires a keen ear and a still keener imagination to elicit it.

Auscultation.—Under normal circumstances the tracheal respiratory sounds are audible up to the level of the seventh cervical vertebra, but not below. Should they be heard over the dorsal vertebræ, then there is strong indication of enlarged tracheobronchial nodes. This is known as the sign of D'Espine. As an auscultatory sign of tracheobronchial glandular enlargement there is probably none that exceeds it in value.

There is a venous hum frequently audible over the upper part of the sternum when the head is extended forcibly. This is the Eustice Smith sign, and is diagnostic of tuberculous enlargement of the glands in this region. Pressure upon the right jugular vein, or the vena azygos major, may be an explanation of this phenomenon. This sign should be diligently looked for when there is any constitutional wasting present. In about fifty per cent. of cases there is also whispered bronchophony over the thoracic vertebræ.

407 EAST 136TH STREET.

Laryngeal Tuberculosis*

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Tuberculosis is the most frequent chronic disease of the larynx, and is almost always secondary to some tuberculous deposit in the lung. The cases of primary laryngeal tuberculosis are so rare and doubtful as to be worthy of report and investigation. In about twenty-five per cent. of all fatal cases of pulmonary tuberculosis, the laryngeal picture forms the saddest part of the last act in the horrible drama. Laryngeal tuberculosis is important to the general practitioner because it is often a means of making an early diagnosis of pulmonary tuberculosis. (It often shows before the pulmonary physical signs are found.) Although pulmonary tuberculosis was known in the time of Hippocrates, the laryngeal affliction was first described by Petit in 1790. Laënnec in 1819 insisted on its tuberculous nature. Then followed a distinguished list such as Trousseau, Andral, Hasse, Rheiner, Virchow, and Heryng. Heryng was the first who treated the ulcers by curetage, followed by lactic acid.

The method of entrance of the tubercle bacillus into the larynx has been a matter of great discussion, and several theories are in vogue. 1. That the infection is carried to the larynx by the lymphatic

or blood stream. 2. By direct infection through contact with the tuberculous matter.

The majority of investigators favor the first theory, I, however, feel that the direct contact theory is probably the correct one for the following reasons: 1. That when infection exists in Waldeyer's ring, some of it drops and naturally falls in a straight line. By examination of the position and structure of the larynx one sees that it must fall into the posterior part of the larynx (or arytenoid region), thus explaining why laryngeal tuberculosis usually commences in this area. 2. That the tuberculous sputum passing over the laryngeal mucosa infects it. (The idea advanced by Rheni and held by many laryngologists today, that a special predilection exists in the posterior part of the larynx for the tubercle bacillus because of the delicacy of the epithelium in that region, I believe erroneous.) The shape of the larynx (the interarytenoid region, shaped like the beak of a pitcher) causes fluids and other foreign matter occasionally to come in contact with this region, but almost never touches the region of the anterior commissure. 3. The fact that the posterior part of the larynx is the musculoarticular centre goes to make this part of the larynx more prone

*Read before the Medical League of Philadelphia.

to various abnormalities and injuries, and therefore more susceptible to infection.

I believe that the statistics, which assert that laryngeal involvement complicating pulmonary tuberculosis amounts to about twenty-five per cent. of the cases, is far from right. It is our lack of training in diagnosing early cases, our being forced to depend mainly upon our ocular findings, and that in most cases of pulmonary tuberculosis, instead of examining the larynx routinely, we examine it only when symptoms pointing to this organ are present; all these combine to lessen the reported percentage of laryngeal involvement in pulmonary tuberculosis. Meyer, in histological examinations of larynges in pulmonary cases that showed no laryngeal symptoms or ocular changes during life, found, however, that laryngeal tissue was tuberculous in five out of six cases.

SYMPTOMS.

The symptoms are both subjective and objective. (It is the visualizing of the tubercle, its microscopic and macroscopic pathology and growth that gives us the keynote to the study of this disease throughout the body and this holds good in the larynx as well.)

SUBJECTIVE.

Patients who know they have pulmonary phthisis, and who present its general symptoms, will usually complain of spells of hoarseness, intermingled with spells of absolute freedom from any vocal troubles. Gradually these attacks of hoarseness lengthen, until they become a permanent feature, and in the later stages of the disease, the voice is almost completely gone, your patient speaking in a faint whisper.

Cough is the most common symptom present, because it is the one most frequently found in pulmonary tuberculosis. In the later stages of laryngeal tuberculosis, the cough often becomes paroxysmal like that of pertussis or when a foreign body is present in the larynx.

Pain, whether on using the voice or in swallowing, is present in about half the cases. At first the patient complains of a tickling sensation in the throat, which gradually becomes metamorphosed into genuine pain. The pain in swallowing depends upon the infiltration and ulceration of the epiglottis and arytenoepiglottic folds. When the ulceration involves the cartilages, tenderness over the larynx may be present.

Dyspnea depends more often upon the lung involvement than the laryngeal pathology. When it does depend upon changes in the laryngeal morphology due to swelling and ulceration, a tracheotomy is often the only remedy to prolong the patient's miserable existence.

Expectoration also depends more on the pulmonary condition, until the stage of ulceration sets in, when a good deal of foul, dirty secretion may be brought up.

Hemoptysis is usually due to a bloodvessel rupturing in the lungs, but may come from the laryngeal ulcerations, and the amount in this case is usually small.

In the last stages of laryngeal ulceration, the symptoms assume the appearance of a general septicemia due to mixed infection of exposed ulceration.

OBJECTIVE.

The patient usually has the general look of a tuberculous person, emaciated, pale, the eyes appearing large, the neck long, a prominent thyroid cartilage, etc.

Among the earliest manifestations of this dread disease, is the peculiar pallor of the laryngeal mucosa, described by Ballenger as "ashen gray."

I have occasionally been able on looking at the pharynx of a patient and noting the wide roomy throat, covered by a dirty, slimy, pale, mucosa, become suspicious of laryngeal tuberculosis, and had the medical man corroborate my diagnosis.

A congestion in the region of the vocal processes is stated by some to be the earliest sign of laryngeal tuberculosis.

The mucosa over the interarytenoid space soon begins to bulge, showing commencing infiltration with concomitant difficulty in adduction of the vocal cords. (It is well described as a filling up of the interarytenoid space.) It has been my habit whenever I see an edema of the mucosa in the interarytenoid space or around the arytenoid, to ask for a chest examination, and I have often been rewarded in spite of the disagreement of some of my colleagues, to find pulmonary tuberculosis present.

This infiltration process continues and involvement of the arytenoid is soon followed by involvement of the arytenoepiglottic folds, thus producing the picture, well described as pearshaped or clubshaped. The infiltration spreads onward and involves the epiglottis causing this part to swell. The epiglottis naturally swells most on its anterior and free surfaces (where the loose connective tissue is so abundant) and so the turbanshaped epiglottis is produced.

The infiltration process is often not as regular as I have described as it may commence almost anywhere. The infiltration is produced by the formation of small tubercles (as elsewhere) which are under the mucosa; the process spreads by the coalescing of these tubercles. The tubercles, being non-vascular, tend to break down and so we arrive at the next stage of the laryngeal pathology.

THE ULCERATION STAGE.

These infiltrated, tumified, ballooned up structures, being made of tubercles, undergo cheesy degeneration and break down, rupturing through the mucosa which covers it, and which previously had shown no signs of a break in continuity, thus presenting to our view the tuberculous ulcer.

The ulceration may be superficial, or extend down to and involve even the cartilaginous framework of the larynx. Textbooks mention an occasional expulsion of cartilage, or even the expulsion of an entire arytenoid during this stage. I have never seen this. After the ulceration stage has been reached, I have noticed a peculiar odor from the mouth of these sufferers. It is not distinctly offensive, but is a stale, mouldy odor. One gets to know this odor, so that on examining patients suffering from pulmonary tuberculosis, at the Philadelphia Hospital, I have often been able from this odor alone, to surmise a laryngeal complication, before using a laryngeal mirror.

Another frequent condition is the formation of new growths in the larynx or tuberculoma. To me it seems that this is an intervening stage between that of tumefaction and ulceration. It seems that new growths occur in these cases when, instead of the ballooned up structure undergoing degeneration and ulcer formation, these tuberculomas form. It has occurred in the more chronic or prolonged cases and seems to be of a protective tendency. It usually occurs in the interarytenoid space. I have a patient under my care now who has laryngeal tuberculoma instead of ulcerations. This process I believe is prolonging his life.

DIAGNOSIS.

The diagnosis is usually an easy matter. The history of the case must be gone into carefully. The patient's statements as to cough, night sweats, loss in weight, hemoptysis, hoarseness, pain, etc., must be investigated.

Objectively, the pharyngolaryngeal pallor, congested vocal processes, filling up of the interarytenoid space, the pearshaped arytenoids, or turban-shaped epiglottis, then the ulcerations and new growths, all point to the diagnosis.

A point which has been of great value to me is remembering that tuberculous lesions usually are at the posterior part of the larynx and are multiple, the other common laryngeal ulceration, i. e., syphilis is usually anterior and not multiple. The cases presenting difficulties are those in which it is necessary to differentiate between laryngeal tuberculosis, syphilis, and cancer. The important leads are often the history, age of patient, presence or absence of a positive Wassermann, finding the tubercle bacilli in the smear or sputum and lastly a microscopic examination of a removed section. Careful study will almost always clear the diagnosis very quickly. It is well worth while x raying the larynx in all cases of pulmonary tuberculosis, even if laryngeal involvement is not seen clinically.

TREATMENT.

The treatment of tuberculosis, whether pulmonary or laryngeal, has made no marked progress in the past few generations.

The same general treatment as for pulmonary

tuberculosis is necessary in treating these laryngeal cases, with special instructions to use the voice as little as possible.

It is always a good plan in all cases of laryngeal tuberculosis when not certain of the diagnosis, to give a course of mercury and iodides. I have no doubt that many cases are a combination of syphilitic and tuberculous involvement of the throat.

During the early stages, that is, the stage of pallor and infiltration, the use of antiseptic and astringent sprays, as one per cent. zinc sulphate or three per cent. formaldehyde, is of some value. In my experience steam inhalations have often made the patients feel worse. During this stage, it may be of value to puncture the tumified area, with a pointed cautery, at white heat. (This causes reactive inflammation, and an ingrowth of newly formed bloodvessels, and so prevents the advance of the ulcerative or tuberculomatous stages.)

During the ulcerative stage the application of a twenty-five to fifty per cent. lactic acid solution into the ulcers, preceded by curreting them is recommended by almost all authorities. I have tried these with no success. The actual cautery may be tried here also. The x ray, radiant ray, sun ray, and radium may be of some value. The most important part of the treatment is in treating the symptoms.

For dysphagia you may have to spray the larynx with a two per cent. cocaine before each meal. Amputation of the epiglottis, when badly ulcerated, will help some. Injection of the superior laryngeal nerve is of great value in alleviating this distressing symptom. Sometimes we may try resecting the nerve. In spite of the treatment you may have to feed the patient with a glass tube, the patient's head hanging forward over the table. (Like feeding intubated children.) You may have to resort to rectal feeding. For dyspnea a tracheotomy may be necessary to prolong life if other remedies fail. For pain I find the use of anesthesin, or orthoform lozenges, very good. Orthoform and aristol insufflations or the laryngotracheal injection of a weak menthol and camphor oil preparation is of some help.

1626 SPRUCE STREET.

Tonsil Enucleation and the Tonsil Enucleator

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DEVELOPMENT OF THE TONSIL ENUCLEATOR.

Since 1889, when Sir Morrell Mackenzie taught me his way of using his tonsillotome, continuous service in the Harlem Eye and Ear Hospital has afforded me the opportunity to examine and become more or less intimately acquainted, medically, with a hundred thousand patients. From the beginning, possibly because their relief was the first operative work offering, adenoid vegetations and diseased tonsils received our best attention. Though numbers

and length of service are not necessarily quality factors, they are offered here as evidences of the experience from which its conclusions and the instrument result.

Until 1910 anesthetics were seldom administered and the operation, a tonsillotomy, was performed with the Mackenzie or Fahnstock guillotine. Later various modifications of these were tried. In 1910, with the necessity for enucleation, tonsil dissection, the snare and anesthesia were introduced. The his-

tory of the next four years was written in blood. That period of long operations, copious and secondary bleedings, incomplete removals, sick patients and long worrisome nights, marks the unhappiest season of my clinical life. The daily clinic brought scores of examples of similar experience elsewhere. Bearing all the responsibility and sharing too often the labor I rapidly lost the old time interest and was glad to let others experiment with innumerable forceps, knives, scissors, hooks, pumps and stitches. Visiting many hospitals did not change the picture, for while here and there one witnessed the wizard operate in his more or less exhibition cases, the average men and their average cases (conditions alone instructive) reminded me of home. I came to feel that the new had no advantage over the old, for while as a rule useful comparisons of the results of various periods and ways of work are delusive, yet it seemed to me our hospital experience did offer this conclusion.

Reviewing twenty years' service in an unusually constant hospital patronage, we did not find that the thousands of tonsillotomies had been insufficient; we did not find that many peritonsillar abscesses recurred after the operation; we did not find regrowth. Instead of portals of infection, we regarded tonsils as possible barriers to infection, and hence could not compare along these lines. But since in many incomplete removals the systemic results were satisfactory I could not think the last thread of capsule a necessary capture, for despite all to the contrary, hemorrhage and death were unpleasantly common. Even today, judging from hearsay and the many suggestions for its prevention, hemorrhage and death are not unknown.

In 1914, I saw in London much excellent work done with the snare, and although its use was confined to the more prominent glands, I was greatly impressed. Home again, I was confronted with a daily tonsil clinic, assistants gone or in uniform and much arrearage of work. I chose the Beck-Schenck tonsillectome and determined to make it suffice. I need not detail the progress. Since 1915 I have enucleated nearly ten thousand times. There has never been a torn palate, a scarred pharynx nor what I term a hemorrhage. Patients have been of every race and aged from two months to sixty-five years.

Reviewing this sufficiently extensive work I offer conclusions under three heads, the tonsil, the instrument, and the operation.

THE TONSIL.

Since no other subjects have found the profession in such happy accord as have tonsil toxemia and tonsil enucleation, it is folly to champion conservatism, and yet in order to preserve so excellent an advance from the disrepute inherent in lay diagnosis and remedy, surely we should at least be able to respect our own decision. Although there may be no denial of the presence of toxins nor of the wisdom of their removal, decision in particular cases may be halted because mere presence is only a possibility of evil, and entire separation from even metabolic poisons is unthinkable. Concluding that immunity is resistance rather than integrity we feel safer in a seaworthy craft than amidst emergency

safeguards. Though laboratory investigation increases our knowledge, it does not always assist judgment.

In two hundred analyses of tonsil content, the usual conglomerate of bacteria was found in all, but the differing proportions and combinations were not helpful. Some specimens were veritable sacks of pus, others largely fibrous, and some were balls of connective tissue. In some tonsils removed because of size, only streptococci were found, in others only pneumococci. Deductions were further impugned by parallel analysis of mouth and throat content. Streptococci, pneumococci, staphylococci, Friedländer, Klebs-Loeffler, tubercle, kleptothrix, and coli in every assortment were constant occupants of throats, the tonsils of which showed only a few streptococci; tonsils diseased beyond description atop necks that never knew an enlarged gland, in fully developed bodies enjoying undisturbed health. In short, we were and still are unable usefully to classify bacteriologically or symptomatically. Rather arbitrarily then we have adopted the following clinical routine.

Remove diseased tonsils. Diseased tonsils are tonsils which cannot keep clean; are obstacles to or traps for food, and are or have been subject to inflammation. Since we cannot decide whether abnormal cervical glands are infected from above or below, we suspect the upper sources and remove the tonsils. Other conditions being equal, we believe buried tonsils more likely to cause systemic or metastatic disturbance than the protruding. Foul breath in children, frequently in adults, may be tonsillar, a bit of blotting paper pressed against the gland will absorb the unmistakable odor and decide. Frequent and stubborn attacks of pharyngitis with little apparent lesion, cease after tonsillectomy. Annoying and not otherwise explained attacks of Eustachian disturbance with pain referred to ear and some pneumatic symptoms are often banished. In all cases of operable adenoid vegetations, tonsils are removed without question. Inflammations provoked by usual causes may prove unable to subside or resolve until a source of infection potent to maintain what it could not begin, be removed. Tonsils are such sources.

When pain, debility, cardiac irregularities and neurasthenias, or the diseases of which these are symptoms, are referred to tonsillar source we seek by every means to eliminate other cause. Admitting the innocence of tonsillectomy we yet respect the discredit of possible postoperative disclosures. Virile minds must avoid "easiest way" diagnosis, not only for the patient's sake, but for the safety, honor and welfare of their own mental processes. In short, we do not see any advance in substituting the name tonsil for the word idiopathic in etiology.

THE INSTRUMENT.

Reviewing our experience with the various means and methods of enucleation the safest, quickest, most reasonable and thorough way was with a snare, and the Beck-Schenck tonsillectome gave the best promise of proving universal. One has but to note the empty fossa and ease of hemostasis to agree. Having attained the manual skill I found the insufficiency of the instrument. It was weak and structur-

ally poor. The lock slipped, the screw skidded, the tips turned and the wires broke. Possessing ten instruments we seldom had four in condition. Struggling with the defects, expense and daily breakdowns brought us face to face with the fact that instrument makers have little real cooperative interest. Tools for the trades are made by tool users—our instruments are seldom more than attempts at following an idea. Even quality of material is largely forgotten, for instance, the present tonsillectome is of the cheapest stock. To overcome these conditions I joined forces with a

mechanic and inventor and familiarized him with the operation; he saw the need and method and learned our ideas. A thorough testing persuades us we cannot claim too much for the result. I am enthusiastic enough to believe that the tonsil enucleator is the last word so long as enucleation is desirable.

THE TONSIL ENUCLEATOR.

This instrument consists of five simple parts; a barrel, finger hold, fenestrated tip, and loop and barrel screw. There are three sizes of tips and loops. The finger hold is of bronze, the barrel screw of drill rod, the loops of spring steel, the whole heavily nicked. There are no thumb screws, no lock, no wire and but one spring. It is simple and clean. It can be disengaged instantly and reintroduced by the operating hand. The fenestrated tip and loop can be changed instantly. It fits the hand, is powerful and permanent.

When the tonsil is expressed, there is no jerk of released lock, but the steady pull on finger hold finds a commensurate advance of the loop up to limit of finger strength—the barrel screw takes hold automatically and turned without slip or break completes the operation. The loop is different from any dull blade or ring hitherto used in shape and movement. The loop does not change in shape but moves concentrically forcing capsule from fossa, its flatness insuring a smooth operation. To surgeons using the snare it presents no change in technic; to the beginner it presents correct mechanics, correctly applied. It is always ready, and perfect. Once possessed there is no further expense for wire or repair.

PREPARATION.

Patients should be thoroughly prepared as to stomach, bowels and bladder. Examination of tonsils and teeth should precede anesthesia, also coagulability of blood where questionable. If the Jennings gag is used, particular attention should be given to crown, bridge, pivot or loose teeth. Waterproof boudoir caps large enough to envelope head and hair and secured with shirr strings, and rubber bibs about two feet square and shaped to neck, are convenient and cleanly.

Ether alone or preceded by gas is preferred. A

full surgical anesthesia for adults; for children as little more than primary as operator's speed will permit. A flat basin is kept on table at right side of head for used instruments; instrument trays are never soiled. Care in this direction saves much sterilizing. Using two pairs of tonsil enucleators

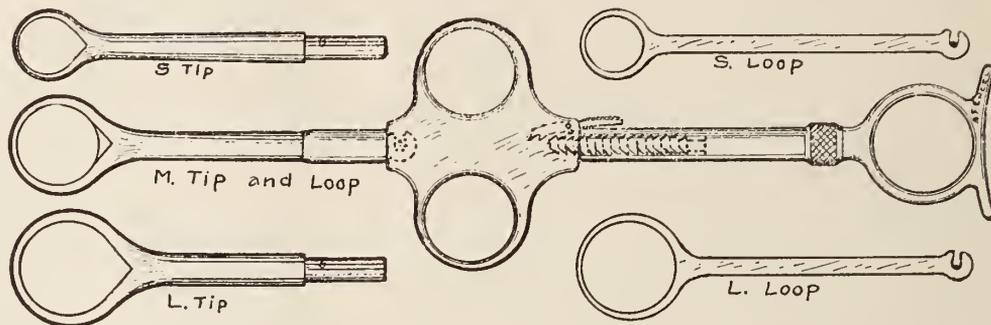


FIG. 1.—The tonsil enucleator, one half actual size.

we sterilize alternately and with two anesthetists and one nurse we operate on eight average patients in thirty minutes.

There should be three trays arranged according to the surgeon's convenience. At the Harlem Eye and Ear Hospital, the operator stands at the patient's right, with a table at the left on which are three trays, as follows:

Tray I.—This tray contains twelve loaded sponge holders, short for children, long for adults. Gauze sponges should be round, smooth, and approximately the size of the fossa. Always have two sizes ready.

Tray II.—This is a table shelf and contains a separator (Hurd); naked snare; metal stitch introducer; metal stitches; stitch remover; mouth gag (Teets); twelve extra loaded sponge holders.

Tray III.—This is the instrument table, and is placed at the right of the operating table, within the surgeon's reach. It contains two tonsil enucleator; two Jennings gags, large and small; two tongue depressors; vulsella; two tonsil forceps.

THE OPERATION.

To succeed in describing an operation so that the reader may be able to perform it, the writer must assume that every learner is a beginner. Only thus can confusion by omission be avoided. The operator must acquire a technic. Certain manœuvres must accomplish definite results, must be executed despite irregularities and with practice become inclusive. To attain manual dexterity it is best to accept a definitely successful routine, with its prescribed fingering, approach, performance and recovery, and master it. Thereafter, personal amendment is timely and may lead to progress.

To enucleate an encapsulated body the instrument must either pass between capsule and bed or else grasp the body close enough to the capsule to pull it from that bed without tear. This second procedure is that of all instruments. To best obtain such a grasp the cuplike area of attachment must be converted into a plane. This is done by pressure.

If we consider the movements of the wire loop of the snare we note that the first pull straightens its sides and draws it into a V. The enucleator loop

on the contrary because rigid, gathers the tonsil concentrically, hugs the basal plane formed by the expressing finger and the capsule is peeled from its bed and enveloped by the extruding tonsil tissue. There can of necessity be no strings or tags, no injury to pharynx, palate or pillars and examination shows an intact capsule and a clean fossa. There is no question theoretically or exception in practice as to the superiority of the flat, dull, rigid steel loop for this manoeuvre. It is original, faultless and permanent.

The pressure is made with the finger against the back of the tonsil through the anterior pillar, extruding or breaking it through the fenestrated tip within which the loop hides. Success depends on the expressing finger. It must test the correctness of the size of the ring which must encircle the tonsillar mass, whether it is round, irregular, flat, buried or lobulated. Force alone often fails, beside unfitting the finger for the next case. The ring must be held forcibly, must include the entire tonsil, and must cooperate with the expressing finger. When the loop is drawn, the expressing finger should feel its advance and must not be relaxed until the loop reaches the limit of the pull, which is generally at the first or second click of the ratchet. During completion by the barrel screw a strong dimpling of the anterior pillar will be observed.

The next requisite is the light. Reflected light is without rival. It is exceedingly difficult to obtain a mirror with the ball on its edge or one of a focus of sixteen inches, yet both are indispensable. The aperture in the mirror should be used, since bifocal vision and keeping the light on the field are essential. It is good practice to wear the mirror constantly *in situ* until it becomes a third eye, for inability to control the light is a serious handicap. The source of light should be at the side of the patient's head at table level and the mirror should be worn on same side. The surgeon should stand opposite the patient's neck and be high enough to obtain free arm, wrist and hand motion at right angles to recumbent pharynx.

Ready when anesthesia is sufficient, introduce gag, being careful of lips. Except for inordinate froth or mucus do not sponge, but having anesthetist hold the head firmly, take tonsil enucleator in left hand, engage left tonsil, break it through with right finger and tighten, giving screw one turn, assistant holding it in vertical position with the fingers of his left hand. Take second tonsil enucleator in the right hand and proceed with right tonsil, breaking it through with a left finger. If tonsils are large enough seize both with vulsella; if not, use two tonsil forceps. Now, your assistant on the left and you on the right, screw the loops home simultaneously and leisurely. Lift them out and as swiftly as possible plug the fossa and press the sponges forcibly in, up and back, raise table head and turn patient's head to side. Always introduce and withdraw sponges with spiral motion. Do not change until bloodsoaked. The fewer the better. The less you touch the pharynx the less retching there will be. The slower you introduce the first sponges, the less accurately they fit, and the oftener you change, the more your patient bleeds. Bleeding stopped,

examine tonsils and fossa minutely. Failure here is inexcusable and expensive. Adenoids should now be removed.

Ordinarily one minute for removal and three for pressure suffices but nothing is gained by slighting pressure. Five or ten minutes longer pressure should be exerted before other measures are even considered. A clean empty fossa, its bleeding points visible and under control, causes neither alarm nor haste. If faulty technic has left tonsil remnant, the small loop or snare will detach it. Should bleeding continue a gauze roll as long as fossa and of bulk permitting opposition of pillars is placed with sponge holder, retained by finger of left hand and the pillars clamped together and to it with one or two Michel stitches. One must not fail too often for the tissue of the pillars will shred and become useless. The stitches may be removed in twelve hours.

In six years I have never known this measure to fail. Sometimes a little more anesthesia is needed but more often even children can be trusted to cooperate with the cool and gentle operator. As a rare exception to the order outlined above, so smooth and firm a surface is presented by tonsil and pillars that it is wise to make a slight separation at the posterior pillar. It should never be extensive, but just sufficient to admit end of tip and permit breaking through. If bleeding occurs several hours later we do not wait, we do not hope or think or use chemicals or ice. We return the patient to the table and light, clean out the cavity and use pressure. If fifteen minutes of intelligent compression fail, we place a stitch and all sleep well.

Six years, nearly ten thousand operations, and no hemorrhage. I hear it said, "Every operator will get his hemorrhage." To be sure, the unsuspected hemophilic, a carotid threading the tonsil may come, but exsanguinations and deaths have not been of these. I think they have been associated with cutting and laceration, with local anesthesia in patients beyond reach or who have lost their nerve, for operators afar or altogether unprepared, for the hesitating, the procrastinating, the casual examiners. They have followed knives and scissors and pumps, prolonged operations and faith in peroxide, adrenalin, horse serum or worse. They have been due to implement, condition and opinion, but not to tonsil enucleation. The much talked of lung abscess must be equally a product of spasmodic, irregular, and prolonged anesthesia.

The important points in this operation are: Two tonsil enucleators; the light; know the tonsil; light anesthesia for children, full for adults; the right sized loop; the fitting sponges; pressure; examination of tonsils and fossa; pressure or stitch. Two instruments! The secrets of perfect operating, speed and bloodlessness hang largely on instrument and accuracy. Two tonsil enucleators save time, save anesthesia and bleeding; prevent postponement, and permit instant pressure on both sides at once.

The operation can be done under local anesthesia, but aside from physical necessity I cannot advise local anesthesia. That an army of men and figures await my head does not change experience. No man can be sure of a patient's nerve, or foresee all complications. We cannot eliminate light, instru-

ments, technic, watchfulness and assistance, and in my experience all these are not common in office or home. The usual reasons for using local anesthesia are inimical to the best interests of the patient and the physician's reputation. There is a further reason. It is manifestly unfair to set adrift a possible hemorrhage; unfair to the patient, to the operator, and to some unfortunate neighborhood practitioner. Possibly a consideration of the golden rule also moves me.

The aftertreatment depends on conditions. Patients feel worse the second day after operation. They often have some fever, pains referred to the ears, and general malaise. Within twenty-four hours

the wounds are covered with lymph which should not be removed; it sloughs in a week or so, absorption from this causes the fever. Cold or hot compresses to the neck often bring comfort and permit sleep and a mouth wash of bicarbonate of soda and water, one dram to four ounces, sweetens and cleanses the mouth. Gargles are forbidden. Anorexia is generally present but there are no diet restrictions. Fresh air, sympathy, and time are sovereign remedies.

With this method and the tonsil enucleator, I do not know of a cleaner, safer, saner or more useful operation than tonsil enucleation.

113 EAST FIFTY-FOURTH STREET.

Peritonsillar Abscess and Its Radical Treatment*

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Quinsy is so common that until recently our profession has given it little attention, and nothing new has been brought forth in the line of treatment. For years we have had the ordinary therapeutic measures. This routine was so familiar to the victims of several attacks that they often refrained from calling surgical aid until the abscess was quite ripe. Nor were they entirely wrong. It was their experience that the doctor stabbed about in a sort of hit and miss fashion until he struck pus. If unsuccessful after a few trials, it was announced that the abscess was not fully ripe, and the process repeated a day or two later if, indeed, it did not fortunately rupture of itself in the interim.

Some four years ago two unpleasant experiences brought me up with a sharp turn.

CASE I.—E. O., aged twelve. On May 8, 1915, the patient had a right sided quinsy, which was opened in the usual manner and a fair amount of pus evacuated. Drainage continued satisfactorily, but swelling and tenderness at the angle of the jaw persisted. Suddenly, at 1 a. m. on the 12th of May, an alarming hemorrhage occurred which continued, in spite of usual treatment, for about two hours. Toward dawn it stopped, but for three days thereafter the discharge was mixed with broken down clots. I felt that I had either made too generous an incision or severed an anomalous vessel.

CASE II.—A month later I was called in consultation to see H. F., aged twenty-two, male, who had had quinsy for five days. The night before, abscess had ruptured spontaneously and three hours later a severe hemorrhage ensued which lasted until morning. Fortunately it had stopped before my arrival, but the patient was quite exsanguinated. A bloody discharge prevailed for a few days, but the patient made a good recovery. This proved that location or extent of the incision has little to do with the cause of hemorrhage. It is simply a question of pus under pressure eating its way

through some of the coats of a bloodvessel and after the sudden release of that support the vessel gives way.

In the literature, Newcomb's well known series of forty-one cases of hemorrhage complicating peritonsillar abscess opened either spontaneously or surgically with twenty-three deaths stands out conspicuously. Since then there have been fatal cases reported by Carmody, Coffin, Lange, and others, while Kenerson mentions a death from edema of the larynx and sepsis, and Lyons had one from a rupture of the abscess into the larynx. One of Newcomb's list bears a brief report. Male, aged thirty-seven, had a hemorrhage twenty-four hours after incision, which recurred at frequent intervals. The common carotid was finally ligated, but death resulted. Autopsy showed the left tonsil replaced by a cavity filled with grumous material in which lay the internal carotid bathed in pus. A perforation in the latter admitted the tip of a little finger.

It is obvious that this list must be absurdly small, as the average physician hesitates to place a fatality of this sort on record, while many of the minor cases pass unobserved or their importance is undervalued. Assuredly, then, an affection which carries such tragic possibilities should not be disregarded.

The tonsil is an ovoid body lying in a triangular prism space. This necessarily leaves pockets at the angles. The upper or supratonsillar fossa formed by the junction of the palatoglossus and palatopharyngeus muscles is well marked, always present and filled with loose connective tissue. The lower ones, less distinct, likewise contain connective tissue, while the anterior pocket shows an extension of the glandular tissue of the base of the tongue carried upward to the tonsil. The gland itself is of the lymphatic type, full of crypts running almost to its outer margins, more or less completely lined by the same squamous epithelium as covers the buccal cavity. The whole mass is enveloped by a thin but tough, fibrous capsule, covering all but its free surface and lower attachment at the base of the tongue.

*Candidates thesis for admission to the American Laryngological, Rhinological and Otolological Society read before the section of Laryngology, New York Academy of Medicine, October 27, 1920.

According to McLachlan, whose excellent monograph on this and allied tonsillar inflammations is commended for your perusal, there are "numerous ducts of the mucous glands which are practically always present in the pericapsular tissue and which open into the mouth beyond the border of the tonsil. These ducts form open channels from the mucosal surface to the gland structures which surround the tonsils on all sides. Consequently, when an infection takes place through these channels, the resulting inflammation will be independent of any process within the tonsil proper."

He is the only one, so far as the literature shows, who mentions these glands within the capsule itself as the cause of quinsy. He holds that the infection of the peritonsillar glands results in an inflammation while the abscess formed ruptures into one of the loose spaces behind the tonsil as the path of least resistance. With this there is a breaking down of some of the contiguous tonsillar tissue. Barnes and the majority of observers believe the infection starts in one of the numerous crypts of the tonsil. Swelling ensues and the duct with its possibilities of drainage is choked off. Either theory accounts splendidly for the difficulty encountered in spontaneous internal rupture through the body of the tonsil. Everyone has watched such a process for days, expecting momentarily to see it break. After the pus ruptures into the supratonsillar space, what happens? Under great pressure, the pus follows the path of least resistance. Outward and backward are the strong constrictors of the pharynx, while above lies the velum palati, another strong muscle which Mosher has shown to be able to tolerate an enormous amount of distension. Inward is the tough tonsil itself, so that the only available direction is downward between tonsil and muscles.

This portion is readily separated by any blunt instrument, once the upper pole is free. There is now a cylinder of pus, with its base at the tongue level and its top in the supratonsillar space. To make the conventional incision through the palate means draining a pus pocket from the top, a violation of one of surgery's cardinal principles. Too much emphasis cannot be placed upon this fact, since it explains those cases where repeated incision or reopening of the original incision is required. In this sort of operation, the logical position for the patient would be with his head considerably lower than his body to favor drainage.

This also probably accounts for some cases of recurrence as Griffin states, part of the pus draining out but leaving a small encysted mass behind, which may remain quiescent for some time, only to break out afresh under proper stimuli. This is analogous to a chronic abscess in an appendix or pus tube which may lie dormant for months or years, only to demand attention when least expected or suspected. Myles speaks of fistulæ which dissect between the muscle planes down even to the hyoid bone. The following case illustrates just such a condition:

CASE III.—A girl of seven years was seen on February 12, 1917, with a history of having had a sore throat and fever some five weeks previous, lasting almost one week. Thereafter she did not

feel perfectly well, but still attended school. Two weeks before a small swelling developed under the angle of the left jaw. This increased to the size of an egg, was firm to the touch and slightly tender. She had been ill for three days with a sore throat especially on left side, difficulty in swallowing, and a temperature of 102.5°. The left tonsil was swollen and the pus behind it was quite evident. Her family physician said there was a slight cardiac murmur present.

On removing the left tonsil, a thimbleful or so of pus was evacuated situated deeply behind the tonsil and at about its upper third. It was so small in amount and so peculiarly located that the usual incision would never have reached it. After drying the tonsillar fossa, it was decided to remove the other tonsil. On attempting to adjust the head, the assistant accidentally pressed on the swollen gland, when a stream of cheesy pus trickled down from above. A curved dressing forceps cautiously inserted along this tract readily entered the distance of two or three cm. The jaws of the forceps were then separated and further pressure on gland delivered fully three times as much pus as in the original peritonsillar abscess, while the gland itself was reduced to less than half its former size. A small gauze drain was inserted for twenty-four hours. A week later the swelling and the heart murmur had both disappeared.

This was undoubtedly a case of low grade quinsy from the first, which did not rupture externally but burrowed its way perhaps along a lymph vessel into a cervical gland, where it found fertile soil. Merrill mentions several cases of undoubted peritonsillar pus which seemed to recover without rupture. It would be most instructive to follow up and learn their subsequent fate.

DIAGNOSIS.

Little difficulty should be found in making an early diagnosis of quinsy. One writer mentions aneurysm, syphilis, diphtheria and Vincent's angina in differentiation. Aneurysm is slow growing, non-inflammatory and pulsating. The false membrane and general symptoms of diphtheria, lues and Vincent's angina, not to mention the laboratory findings, should readily decide the question here. There are cases of acute phlegmon of the pharynx and fauces which may tax one's skill. One important point is that the collateral edema of phlegmon, due to its wider interference with circulation, is far more rapid and diffuse. Another valuable point is, if one inserts a finger slowly along the teeth to the soft palate, a point of exquisite tenderness will be found, which will instantly be made known by the patient. This pain will usually radiate up to the ear. No such point exists in a phlegmon, as there is no localization of pus. A retropharyngeal abscess simulates a peritonsillar abscess, but is found more often in infants who rarely have quinsy. Furthermore, it pushes the posterior pillar forward as well as the tonsil itself. In peritonsillar abscess this pillar is always *in situ*, although frequently edematous.

TREATMENT.

There is a wide diversity of opinion as to how, when and where to open a circumtonsillar abscess

by the different authorities. According to Merrill, Kyle advises scarification and deep puncture. Roe condemns scarification, but recommends an "incision just inside the half arch of pillar, cutting the horizon and followed with vigorous use of the probe." Shurley advises incision through the anterior pillar. Killian "opens above in supratonsillar fossa with a probe." Roy modifies this by making a preliminary incision for introducing the probe. Bosworth locates by palpation, makes a small incision, and uses a probe. Price and Browne "do not open until morally sure pus is present." Bishop opens near edge of pillar as "soon as abscess can be discerned." C. H. Knight uses an angular lance shaped cataract knife passed obliquely upward and inward parallel to the fibres of the palatoglossus muscle and searches with a blunt probe and polyp forceps. Hays uses a special trocar cannula on a sharp pointed dressing forceps. Ballenger dissects behind the anterior pillar until he reaches the abscess cavity.

It is selfevident that such a conflict of opinion by the best men in our profession for the treatment of so common a surgical condition as quinsy proclaims that something is wrong. It is only when all are practically agreed upon a surgical principle or technic that it can be said to have a definite status in our work. For example, the Schwartze mastoid operation is recognized throughout the world as the one giving best results, placing it upon a high plane of perfection. No one can deny that more or less indefinite stabbing or probing of an abscess, the extent and location of which is not clearly defined, is unsurgical and unscientific.

Barnes was the first in this country, so far as I am aware, to remove a tonsil for the radical cure of quinsy. I have been doing this operation with excellent results for the past two years. On the whole it consists of the regular dissection operation for tonsillectomy with a few essential differences.

The time to operate is just as soon as the diagnosis is clearly established. Barnes found pus thirty-six hours after the onset of symptoms, and I have found it twice in forty-eight hours. The earlier the operation the better for all concerned. First, the patient's strength and morale are on a higher level than after several days of pain, loss of sleep and more or less starvation. Second, there is far less edema and necrosis of surrounding tissues, and, finally, valuable time is conserved. Local anesthesia is almost useless. The amount of cocaine needed is so great as to be dangerous. Drugs such as urea and quinine or novocaine necessitate extensive infiltration, which adds more pain to that already well nigh unbearable. Furthermore, this infiltration into edematous areas favors necrosis. In all these cases, ether sometimes preceded by gas in adults, was used. I am aware of what has been written against this procedure in throat affections. St. Clair Thomson quotes Maughn and Low, but the original article cannot be found under that reference (1).

Hubbard reported a case of sudden death in a man with quinsy to whom gas had been administered even before any surgical procedure. His patient, however, was of a highly neurotic temperament, who had been ill for some days, had had several attacks previously, and was probably quite septic.

In my series I have encountered no such experiences. At no time were there any alarming symptoms. The breathing, due to mechanical obstruction, was often noisy and labored at first, which disappeared once the offending tonsil was removed. Under the precautions to be noted, it is not easy to explain why the administration of ether should be more dangerous for this operation than for any other about the throat; for example, a simple tonsillectomy. Obviously, a patient ill for a week or more, who has had little or no nourishment and sleep for several days, is a poor operative risk. But, as stated, one ready to do a radical operation has no need or excuse for waiting until his patient has reached such a deplorable condition. Moreover, an intelligent patient will gladly welcome any suggestion which will make such a period of waiting unnecessary, particularly if the victim of former attacks.

A certain armamentarium is absolutely essential. The mouthgag must be well fitting with a tongue depressor attached and an anesthetizing tube along its dorsal surface. This not only holds the jaws well apart, but controls the tongue and allows a steady flow of vaporized ether to be administered without interruption. With this is required a combined electric suction and etherizing pump, a tube from the latter being attached to the dorsal tube of the tongue depressor. An electric head mirror is essential. No operation should be attempted without these implements in good working order. The remaining instruments are those ordinarily used in the dissection operation, which each may select according to custom and preference.

The affected side is attacked first. A small incision is made in the plica triangularis as low as possible, just behind the anterior pillar, with a sharp pointed knife. No matter how great the swelling, this small space can always be found by pressing the base of the tongue downward and forward. In this slit, a dull pointed but sharp edged knife is inserted and carried upward to the dome of the tonsil. The dissection is now continued between tonsil and pillar so that on retraction of the latter almost the whole of the anterior surface of the gland is brought to view. Up to now not a drop of pus is seen, for you will recall it has been stated that the pus lies behind the tonsil at its upper pole, or has gravitated below. The dissector can now be carried into the superior fossa, where pus will be found. The suction tube should be at hand, and when pus begins to escape nothing should be done but the taking up of every bit of pus as it exudes. When this has ceased, the tube is slipped into the abscess cavity to its base and every remaining drop of pus drawn up. (I use a rubber tipped metal tube, the calibre of a lead pencil.) When one feels sure that the abscess is empty, the operation is continued as an ordinary tonsillectomy. Where the case is of more than three days' standing, the posterior surface will already be dissected by the column of pus mentioned. All that remains is the separation of the thin attachment of the posterior pillar and a snare clips off the tonsil at its base. The fossa is now swabbed with a weak alcoholic solution of iodine. If one desires, the second tonsil may be

removed, since this is rarely free from infection.

During the first of my cases I feared doing this, but subsequently I found there was no added risk, and now I do so as a routine measure unless specially contraindicated. The bleeding was always less on the inflamed than on the nonaffected side, which is explained by the more or less occlusion of the surrounding vessels from longstanding pressure.

Recovery is marvelously prompt as far as the symptoms of quinsy are concerned. All the acute pains radiating to the ears and the choking sensation on deglutition disappear as if by magic. In its place is the sore throat of a tonsillectomy. To most patients this is such a marked contrast to their former pain that they expressed a grateful appreciation. At least they could swallow fluids with comparative comfort. Aftertreatment and complete recovery are about the same as in uncomplicated tonsillectomy.

I have performed this operation on fifty-two patients since May 4, 1916; in the first seven I removed one tonsil. The oldest patient was forty-seven years, the youngest three and a quarter years. All but four of the patients were victims of previous attacks, and welcomed the suggestion of a radical removal of the offending tonsil. Of this list there were two deaths: two weeks, and fourteen hours after operation. The first was due to no fault of the operation, but solely to that of the operator.¹ The second I will leave to your judgment and welcome a verdict.

CASE IV.—Was a boy of three and a quarter years, the youngest patient with quinsy of which I have any knowledge. The patient was seen at noon, March 28, 1919, after a week's illness, which had been diagnosed as a simple tonsillitis. For the past four days he had eaten nothing but small quantities of milk and water. The left tonsil bulged beyond the median line, while pillars and uvula were quite waterlogged. There was a marked left sided adenitis. Tonsillectomy was advised, but the patient was taken that evening to a well known specialist, who made an attempt to incise the abscess, without success. That night the patient was worse than previously, and he could not lie down without choking and turning blue. He dozed off occasionally in his mother's arms, but was awake most of the time. The next morning his father begged that something be done, and at 12:30 p. m. a radical removal of tonsil and abscess was performed at the hospital. The pus was deeply seated behind the tonsil, which probably accounts for the previous operator's failure to find it.

The operation lasted about ten minutes. Hemorrhage was slight and the patient was fully conscious in a half hour. During the afternoon he was cheerful, took ice cream and milk, and slept about an hour. At 9 p. m. I saw him and he was sound asleep, breathing regularly though perhaps somewhat rapidly. His mother was delighted with the change, and remarked that the child had been better for the previous six hours than for six days. Suddenly, at 11 p. m., he became cyanosed and stopped breathing. The house surgeon did a tracheotomy. The heart was beating, but respira-

tion was kept up by artificial means for half an hour. In the meantime I was called and found the patient totally unconscious, with a rapid pulse and slightly cyanosed. The throat was absolutely dry of blood or pus, and the collateral edema of pillars and uvula were comparatively nil and the lungs were perfectly clear. After a time the patient, under stimulation, breathed voluntarily, but the breathing was of the Cheyne-Stokes type. Several times even this ceased, and, finally, in spite of all efforts, he died at 2 a. m. without having regained consciousness, thirteen and a half hours after the operation.

No autopsy was allowed, but the tracheotomy wound was enlarged sufficiently to remove the thymus. It weighed twenty-four grams, which, although not excessively large, is still above normal. Symmers mentions the fact that death occurs in status lymphaticus in two ways: "First and most frequent is of the nature of an anaphylactic reaction due to sensitization of the body by a specific nucleoprotein formed in the lymph nodes as the result of necrosis of numbers of germinal follicles. Before the so-called anaphylactic incubation period has expired, the tissues are again subjected to the action of the same protein formed in the same type of tissue in response to an apparently trivial injury, and in this way the anaphylactic reaction is completed. The second cause is found in the form of a spontaneous rupture of a cerebral vessel following a trivial injury, the deficiency in the vessel wall being most noticeable in the muscular coat."

One may doubt that this is a case of status lymphaticus, but the cause of death must be explained. There was no hemorrhage, it was too soon for sepsis, and he lived too long (three hours) for a cardiac or pulmonary embolus. Undoubtedly the patient's previous week of illness and starvation had much to do with the fatal outcome, and is a strong plea for early operation.

It is expected that there will be objections to so radical a procedure, and they deserve consideration.

First, is hemorrhage. Unless one has operated under these conditions he is in no position to support his objection, since there is surprisingly little.

Second, danger from the anesthetic. This has already been taken up, but admits of argument.

Third, sepsis. It is a firm surgical principle that there is far more danger of infection from enclosed pus than from a large, free draining surface, and this operation not only opens a pus pocket to the freest drainage possible, but removes the offending cause. There is, of course, the possibility of a secondary infection from the bucal cavity, but no more so than in any other throat operation. The small percentage of such septic complications after tonsillectomy in the hands of good men proves this danger to be quite negligible.

Here, then, is a method of treatment for quinsy which is surgical, in that it removes the cause, that one operates with every step under sight and control, and that it saves the patient needless pain and loss of time and strength.

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1. THOMSON, ST. CLAIR: Quoting Maughn and Low, *British Medical Journal*, March 7, 1907.

¹ A report of this case will appear in the author's reprints.

Tonsillar and Adenoid Tissue Under X Ray Treatment

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Heinicke, as far back as 1905, reported the effect of the x ray on lymphatic tissue. Various observers since his time have noted this marked susceptibility of lymphoid tissue to the x ray, a susceptibility so great that almost all lymphoid structures in the body may be removed by radiation, without appreciable effects being observed on other structures. This reaction has been so well demonstrated in such conditions as Hodgkin's disease, tuberculous glands, and the leucemias, that it is now considered axiomatic in x ray therapy. In the past, the doses used for the reduction of lymphoid tissue were large and, consequently, there was an element of danger, so that radiation has always been considered a radical rather than a conservative method of treatment. However, if by means of small doses of x rays, properly measured and given with reasonable safeguards, lymphoid tissue can be reduced, there is no reason why it should not be used in a variety of conditions.

Histologically the tonsil is constructed much as other lymphoid glands, except that on one side it is covered with a mucous membrane in which there are numerous crypts dipping down from the surface. In addition, there are other lymphoid deposits which may show hypertrophy; on the pillars of the tonsils, and occurring as masses back of the posterior pillar. If lymphoid tissue is responsive to small doses of x ray, then obviously, the tonsil offers not only an easy means of proving this, but also a very important field for x ray therapy.

It was with the idea of deciding this that Dr. W. D. Witherbee, radiotherapist to the Presbyterian Hospital in New York, began treating a series of cases at the Rockefeller Institute for Medical Research, in December, 1919. The results of this series, as well as of subsequent cases, are now a matter of record, and numerous articles thereon are in the literature. Many followers have sprung up so that the treatment of diseased tonsils and adenoidal tissue by x ray is an accepted method in many quarters.

I had the good fortune, through a personal acquaintance with Dr. Witherbee, to be informed of his apparent results before they were published in the literature. Consequently, I treated my first case in April, 1920, and during the past year I have treated fifty-four cases in private practice and several more in the hospitals. As Dr. Witherbee conducted his series of cases in the Rockefeller Institute, he was able not only to make clinical observations, but also to have bacteriological and microscopical studies made of the effect of his treatment on the tonsils. My observations, however, have been purely clinical. The bacteriological findings of Dr. Witherbee might be summed up by saying that approximately a month after treatment was initiated no colonies of *Streptococcus hemolyticus* or *Staphylococcus aureus* could be found in tonsillar tissue

that before was positive. The histological study showed destruction of lymphoid cells, particularly those that were in active mitosis, and the consequent shrinkage of the crypts. This occurred without damage to adjacent normal cells.

In the cases which are the subject of this paper, the patients were examined as follows: The throat was examined and notes taken as to size and location of tonsils and adjacent lymphoid tissue, its general appearance, whether fibroid or hypertrophied; the abundance of crypts, the presence of surface exudate or filled crypts; the condition of the glands of the neck; general condition of the patient as to height and weight; the presence or absence of heart murmurs or hypertrophy, chorea or other sequelæ of infected tonsils. If the patient was a child, the parents were questioned as to appetite, condition of bowels, behavior, and general habits, and the history was studied for tendencies, such as frequency in taking cold, etc. The patients reported every month at the start, but in the fall of 1920, the technic was changed so that they came back every two weeks. At each return the patient was weighed and the throat examined for changes in the tonsils, either as to size, presence of exudate, prominence of crypts, the condition of the mucous membrane. If there were cardiac complications, the heart was examined. Frequently, if the case had been referred, the family physician kept track of the general physical changes in the patient.

The patients varied in years from two to fifty-six. Many were cardiac, several were choreic. Among the adults several were asthmatic. In those cases which might safely be considered operable, the patients were generally children whose parents refused operation.

RESULTS.

The results might be classified as objective and subjective. The objective results were changes in the appearance of the tonsils and, in children, gain in weight. The changes in the tonsils were variable, at the end of a month a distinct wrinkling of the mucous membrane and disappearance of cryptic contents were noticed. By the time six to eight bimonthly treatments had been given, practically every fibroid tonsil had returned to normal size, or even less. The adjacent lymphoid tissue shrunk in varying lengths of time within this period, depending on its extent. The large hypertrophic tonsil was not so amenable to treatment in regard to reduction in size. It always shrunk somewhat, but in many cases its abnormal size was still quite noticeable at the end of the usual course of treatment. However, it always changed in color and its crypts emptied. Several of these cases, in which the tonsils are still quite noticeable, so that any nose and throat surgeon would feel quite justified in operating after the usual course of treatment, are now under observa-

tion, without treatment, the patients reporting every month. A noticeable shrinkage is occurring gradually from the effects of the treatment without further doses of x rays. Whether this will reach a stage that will satisfy all critics, cannot now be stated. With few exceptions all children gained in weight, the amount varying according to age and general condition. These findings have not been tabulated so that the normal gain in weight a week for each age treated can be compared. One patient nine years old gained nine pounds in three weeks. The average gain for all ages under sixteen was half a pound a week.

Subjectively, the results were even more satisfactory to me, to attending physicians, and to the parents in practically every case reported. There was improvement in cardiac conditions, with gain in appetite, gain in self-control and much less susceptibility to colds. Some responded much more readily than others. In certain cases the results were spectacular and in others disappointing, but this is common experience with any remedial agent and is due to the human equation. Any therapeutic measure must be judged by its average, and not by the individual case, its spectacular success or signal failure. In the cases under observation during the past year, the average of success, from a clinical viewpoint, has been high.

TECHNIC.

In the beginning, treatments were given every month through two portals of entry. This was seen to be rather too far apart, so the time interval was reduced to two weeks. Briefly, the technic was as follows: The head and shoulders of the patient were covered with lead except for an opening varying, according to size of the patient, from two inches to three inches square. This was placed so that an area extending from the external auditory canal to the hyoid bone, with the angle of the jaw as a centre, was exposed, the patient lying on his chest and the head being turned to one side. The tube was tilted so that the central ray would pass behind the angle of the jaw through to the opposite angle, and the area exposed was of such size that the cone of rays would take in the nasopharynx and the peritonsillar spaces. A ray, filtered through three mm. of aluminum, with an eight inch backup spark gap five ma. of current, at a ten inch target skin distance, was given. The time of exposure varied, depending on the age of the child and the size of the tonsils, but the dose was never larger than one skin unit, filtered, or slightly more than one third the amount necessary, if given at any one time, to produce a faint erythema. No erythema has been produced in any case, no matter how many treatments were given. Witherbee says that forty of these treatments can be given, if necessary, without trouble, provided the proper time interval is observed. The average patient takes six to eight of these treatments at two week intervals.

It is common experience to have both the profession and the laity regard this method of treatment with fear. They expect burns, later developing into cancer, and disadvantageous results to the pituitary, thyroid or parathyroid glands. In the

course of treatment, many common ailments that may afflict the patient in the course of treatment, and many unusual conditions, such as stuttering, are attributed to this treatment. The doses used for tonsillar treatment is much smaller than that which has been used for years in the treatment of tuberculous glands of the neck or in ringworm of the scalp. Dr. Witherbee says in reference to this: "A review of the literature on this subject does not reveal the report of any case in which the untoward effects of x ray on the thyroid, parathyroid, pituitary or parotid gland has been recorded." This does not mean that any one can purchase an x ray tube and turn it on without danger. The x ray is a keen edged instrument. It must be well understood from a physical and biological viewpoint. The technic must be acquired, the same as the surgeon acquires his. Most of the ill fame attached to radiation has come from the hands of the poorly instructed. But in the hands of one who is familiar with measurement and biological effects, it is as safe as many other therapeutic measures.

This *modus operandi* would seem to be indicated in cardiac and choreic cases and in fact all cases where operation is for any reason questionable. In patients with fibroid tonsils, it will do fully as well as surgery; in hypertrophic cases with mechanical obstruction, surgery is the method of choice unless contraindicated. In adults, because of the greater hazard, and because of the greater incidence of lung abscesses following an operation it should certainly be considered. In any case it may be a useful adjunct to the surgeon in removing adjacent lymphoid tissue which cannot be removed with the knife. Dr. Ralph Herrendeen, radiotherapist to the Woman's and the Memorial hospitals in New York, informed me that he had quite recently treated with x rays four cases of rheumatism, wherein all foci of infection had been diligently sought for and it had been decided that the focus must be buried in fibroid tonsils. These cases are recent and have not yet been concluded, but to date the improvement is marked and the patients attributed the results to their treatment. The advantages of this method of treatment are obvious, the greatest disadvantage is the time required to produce the results. In some cases this is important, in others it is negligible.

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601 MATISON AVENUE.

Tonsil Thyroid Syndrome in the Female

(Preliminary Report)

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INTRODUCTION.

This discussion will deal with cases of chronic tonsillar infection, in which, after a period of fifteen to thirty-five years, a clinical picture corresponding to that of hypothyroidism was well developed. I wish to base this discussion upon two premises, the first being that in the present state of our knowledge we are not at all sure to what extent the constitutional or metabolic disturbance producing the clinical picture known as hypothyroidism is due to hyposecretion of the thyroid gland, and how much of it is brought about by disturbed function of the adrenals, pituitary body, and the gonadal system. My second premise is, that chronic tonsillar infection or chronic infection of their contiguous structures, as it existed in these cases, is disease producing, because of the local disturbance and the constitutional effects resulting therefrom. Both of these viewpoints are, I believe, in keeping with the present day knowledge, and are reiterated only to point out that we are dealing here with a concrete example of a so-called endocrine dysfunction secondary to chronic infection. Acute and chronic infections have been shown by a number of writers to be the cause of endocrine disturbances, but in so far as I have been able to study the literature I have not found a concise description of the specific syndrome which I wish to present here.

PRESENT SERIES.

The first of this series of twenty-five cases was diagnosed about eight months ago. It was a very striking example of this condition, and since then I have found that these cases are all striking and the diagnosis can be made in a few minutes upon the clinical findings alone.

The patients in this series were all females and, as previously stated, ranged in age from fifteen to thirty-five years. So many of the symptoms noted involve the female generative system, that the clinical picture, as presented here, can exist only in the female.

SYMPTOMS.

The symptoms presented by these patients will be enumerated in the order of their frequency and therefore of their clinical significance. The major symptoms were present in all cases. The symptoms of secondary importance were less constant.

Tonsils.—Enlarged and diseased tonsils were present in all cases. In many the tonsils were large enough to fill half the pharyngeal vault, the kind we see in patients who have fought off their physician's advice for years. They gave a history of frequently recurring inflammations and that they were more or less conscious of their throats most of the time. There was generally an associated chronic pharyngitis; the younger patients had adenoids and a number of them had sinus involvement.

Lymphatic glands.—In practically all cases the cervical lymphatic glands (tonsillar node) were large and usually tender.

Thyroid gland.—The thyroid was more prominent than normal in practically all cases. In the extremely obese patients it was not as visible nor palpable as in the others. In half of the cases it was disfiguring. I believe that these goitres are of the colloid type.

Body weight.—In sixteen out of twenty-five cases the body weight was more than twenty pounds above the normal; in nine cases it was sixty to one hundred pounds above normal.

Mental and nervous symptoms.—The patients in whom this condition is well marked complain of a tendency to drowsiness; they seem unable to get enough sleep. Frequently their mental attitude is that of general discontent, they are lacrymose, and at times suffer from neuralgias.

Skin and subcutaneous tissues.—The complexion is pasty and sallow, the skin dry and rough, especially over the arms and body, and there is a thickening of the subcutaneous tissues. The hair is dry. Morning puffiness of the face, especially around the eyes, is noticeable. There are localized areas of pigmentation; nails are brittle; palms of hands are moist; eyebrows are scant at outer edge; there is alopecia areata or falling out of hair.

Nutritional manifestations.—As previously stated there is a tendency to obesity in the majority of cases and undernutrition in none. With this obesity there is a subnormal temperature, which is an evidence of suboxidation. It is striking that these overfat individuals complain of being cold, when others about them are perfectly comfortable. In mild weather they continue sleeping under blankets and at all times require more covers than other members of their household. They complain of cold feet. In stature they are under the average. They complain of fatigue. Our observations upon the basal metabolism in this series are incomplete. As far as we have gone they are lower than normal.

Digestive system.—The teeth secondary to the infected throats are usually diseased; they are carious and vulnerable to infection. The pharynx and tonsils have already been mentioned. The tongue may show thickening and at times tooth marks are to be seen upon the lateral surface. In some patients I have observed deposits of myxedematous tissue on the tongue, soft palate and pharynx. Constipation is the rule. As a class these individuals are not large eaters. They volunteer the statement in their complaining fashion that, although they are the lightest eaters in their families, they continue to be uncomfortably fat. As a rule they are "no breakfast eaters." They cannot take food in the morning probably because of their suboxidation and partly on account of the condition of their throats.

Circulatory system.—There is a tendency to dyspnea on exertion greater than normal. The blood pressure is low, the pulse rate is slow, and varicosities are frequently observed. The hands are cold and moist, the palms frequently wet; at times the hands are cyanotic.

Generative system.—Eight patients in this series were married women; five were sterile, one had one child, and one had four children. Menstruation was disturbed in nearly all cases. Usually the period lasted from one to three days; at times it was abnormally prolonged. The amount was small as a rule; in some it was excessive. The breasts were excessively developed in more than half the cases. These cases present an interesting clinical picture; amenorrhea and sterility with excessive development of the breasts which in more than half of these individuals are useless organs.

Urinary system.—The bladder gave evidence of irritability in a number of the patients. The renal function was apparently normal and uranalysis showed no alteration in the water, urea, chloride, acids and ammonia output. Three of the older patients showed evidences of nephritis, two of them with arterial hypertension.

Vegetative nervous system.—These patients as a group did not fall into either the vagotonic or sympathicotonic type.

Blood.—The red cells and hemoglobin were about normal. There was no leucocytosis, the mononuclears were high and polynuclears were below the average normal.

COMMENT.

The syndrome as here presented is a relatively frequent occurrence in the female up to middle life. The pathological sequence seems to be first a chronic tonsillar infection, long continued, resulting in a constitutional effect. The result is apparently a colloid goitre with a well developed clinical picture of hypothyroidism. If the latest theory concerning the cause of colloid goitre is correct, namely, that colloid goitre is produced by a lack of iodine, it would seem quite possible that in the chronic tonsillar infection the system becomes impoverished in iodine and colloid goitre with hypothyroidism is the result. The picture associated with chronic tonsillar infection in the male, especially in early adolescence, is quite different, and will be the subject of another paper.

ORDER OF FREQUENCY OF CHIEF SYMPTOMS.

Chronic tonsillitis, hypertrophic; tonsillar node; thyroid gland enlarged; complexion pasty and sallow; skin dry; hair dry; breasts, excessive development; menstrual function disturbed; subcutaneous tissue thickened; obesity; tendency to sterility; ate no breakfast; hands moist, cold, cyanotic; body hypersensitive to cold; blood pressure low; pulse rate slow; tongue thickened and tooth marked; speech thick and voice coarse; puffiness of face—eyelids swollen in the morning; drowsiness; early fatigue; dyspnea on exertion; alopecia; nails brittle; neuralgias.

THE JENKINS BUILDING.

The Diseased Tonsil

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The removal of tonsils has been done since the days of Hippocrates. That this operation has real value is thus evidenced by the test of time. Formerly the chief indication for such procedure was tonsils which were sufficiently enlarged or which otherwise interfered mechanically with breathing, swallowing or speaking. In the last fifteen years, however, considerable attention has been paid to the nonobstructive lesions of the tonsils, and great emphasis has been laid on the fact that they are frequently responsible for affections of other organs and for systemic diseases. This view has been readily accepted by physicians, and tonsillectomy has now become the most frequent operation. Yet every physician who has followed up his patients subsequent to the operation can recall cases where, in spite of excellent technic, the condition which this operation was expected to relieve remained unimproved. With the increase in the number of patients operated upon these results are becoming more frequent. It is therefore proper to review the subject with a view of determining under what circumstances the decision to operate can be based on evidence which is not sufficient.

Attacks of tonsillitis as an indication for operation are a symptom that is likely to prove misleading. Tonsils are not infrequently affected by causes which lie largely outside of the tonsil itself. Pathological conditions in the mouth, nose (1), sinuses, and adjacent structure are often the chief cause for such attacks. Intranasal operations (2) or even packing the nose for forty-eight hours produces tonsillitis with such frequency that some physicians regard this occurrence as being almost a rule (3). Tonsils may also be accidentally infected from outside sources, either through air or through food. One suspects such an infection when this disease is particularly prevalent at certain seasons of the year, or when several cases occur in a family at the same time. Epidemics of sore throat have on several occasions been definitely traced to the use of infected milk. Tonsillitis, either as a prodromal symptom or as a concomitant condition, occurs in connection with certain infectious diseases, particularly the exanthemata. Under these circumstances the tonsillitis is part of the disease, not unlike an inflamed Peyer's patch which regularly occurs in typhoid fever.

Changes in the appearance and structure of the tonsils, to which condition the term diseased tonsils is now frequently applied, is another symptom that needs proper interpretation. Some of these changes are the result of a process incident to growth (4). The hard, fibrous tonsil often found in the adult appears to be in harmony with a similar change which takes place in other organs of the body. Pathological changes in the tonsil are frequently due to systemic disturbance. Alcoholism, constipation, protein intoxication, gout (5), rheumatism, and kindred affections, which sooner or later induce definite changes in the various tissues and organs of the body likewise affect the tonsils. The tonsillar lesion produced by secondary or tertiary syphilis is typical and readily recognized. The older clinicians have attempted from the appearance of the affected tonsil to determine the causes responsible for such affection. Although today we believe that it is more important to remove tonsils than to find out why they are diseased, the fact remains that instead of being the cause, diseased tonsils are more often the result of systemic disorders, faulty metabolism or long continued hygienic errors.

In removing the diseased tonsils, what we really remove is the end product, or the result of a process, without removing the basic cause, and this is often strikingly evident from the effects of a tonsillectomy. That cause, whatever it may have been, continues to act on the lymphoid tissue that remains. The tonsil, the adenoid, the lingual tonsil, as well as the collection of lymphoid nodules distributed between these structures and on the posterior and lateral pharyngeal wall, are all made up of lymphoid tissue which is identical (6). The pathological process, which usually affects all this lymphoid tissue alike (4), becomes more evident after the tonsil operation. In about twenty per cent. of the cases in which operation is performed there is subsequent hypertrophy. The small invisible nodules become macroscopical (6), and by observing these one can tell with a fair degree of accuracy and without knowing the history of the case, whether the tonsil was removed or whether it naturally atrophied. Occasionally these nodules reach such size as to produce definite symptoms, or, lying near the tonsillar fossa, they fill that space, thus giving rise to what is sometimes considered as a recurrence (7). According to Stewart (8), in forty per cent. of the cases in which operation is performed there is a recurrence of tonsillitis. Instead of being limited largely to the faucial tonsil, the angina is likely to be more diffuse. Even though this number is considered somewhat high by other observers, the recurrence is significant, and shows that some other condition rather than a purely local one is at fault.

The removal of such affected tonsils is nevertheless urged, because, once affected from whatever source, they are believed to be a menace to the individual. This view is maintained largely because the tonsils harbor a number and variety of bacteria, and the crypts usually contain retained secretion. Although it can be readily admitted that the decomposed and fetid secretion requires for its own sake appropriate treatment, the suspicion may well arise whether the ordinary material within the tonsillar

crypts acts as a focus of infection as frequently as is commonly supposed (9). At any rate, this condition is fairly universal. All or nearly all human beings are born with tonsils, and except for a day or so after birth tonsils are never sterile, and the crypts under all circumstances contain a varied amount of debris (6). Neither is this condition limited only to the faucial tonsil, but occurs also in all other lymphoid tissue of the Waldeyer's ring.

French (10) has shown that such occurrence is common in the infratonsillar nodules. These nodules are from a quarter to an inch and a half in length, and from one eighth to half an inch in width and thickness, and beginning from the lower end of the tonsil they extend downward and divide into two branches, one branch going to the front of the epiglottis, the other becoming continuous with the lingual tonsil. Because the capsule of the tonsil is often continuous with the capsule of these infratonsillar nodules it is often difficult to determine where the tonsil ends and where the nodules begin. The crypts in these nodules are tortuous and deep, and the retained infectious material in the crypts of these nodules, according to French, "probably amounts to or even exceeds the quantitative equivalent of the infective debris in extensively diseased tonsils and the pathogenic organisms isolated from the debris in both localities are practically the same." Referring again to these nodules, he says: "As they are in truth but offshoots or branches of the faucial tonsils, it may come to be a habit to speak of them as parts of the faucial tonsils instead of separate structures" (10). Even the more enthusiastic advocates of tonsillar infection are pretty generally agreed that tonsillectomy, as far as the removal of the infected focus is concerned, is inefficient. The small remaining part of the tonsil continues to act as a source of infection. Unless we conclude that the lymphoid tissue in the tonsillar fossa has a greater inherent tendency to cause disease than the identical tissue a fraction of an inch lower, our tonsillectomies cannot be more efficient than our tonsillectomies.

For this reason it has been suggested that the infected nodules, as well as the lingual tonsil, be removed at the time of the tonsil operation, both of which—as has been recently demonstrated—can be removed with the capsule (11). Whether an extensive surgical invasion in this area will become popular is difficult to foretell. It seems more likely, however, that soon we shall have to admit that the removal of all the infected lymphoid tissue is as impossible as the sterilization of the mouth. For this reason it is both timely and proper that we seriously consider the advisability of modifying, or even abandoning boldly, our present views regarding tonsillar infection and its surgical treatment. We all know that the number of bacteria removed at an operation is only a fraction of those that remain, and health is more a matter of individual immunity than of the germs present. A diphtheria carrier may require an operation because he is a menace to others. As far as he himself is concerned, this condition is of little importance. Of no more importance to the health of the individual are the tonsils which harbor *Streptococcus hemolyticus*, the *Strep-*

tococcus viridans, and a host of other organisms that are usually present in the oral cavity.

At first it would seem that such radical departure from the accepted views is dangerous, and is at variance with the results obtained in tonsil operation. The literature also is filled with striking cures which at times follow the removal of the tonsils. The occasional brilliant result is always impressive, and lingers in our memory; the others conveniently explained and forgotten. The value of any therapeutic procedure cannot be judged by the successful cases alone, unless these are carefully compared with the failures. Judging the operation in this manner, we are forced to conclude that the results obtained from the removal of tonsils in arthritis, neuritis, myalgia, gout, rheumatism, anemia, neurasthenia, and a score of other chronic conditions, are not in any way different from those obtained from medical, mechanical or other nonsurgical measures. Even in acute articular rheumatism, where it was hoped that an early operation would prevent an attack and the attendant cardiac complications, our expectations have been based more on hope than on facts. The underlying cause responsible for this malady is still so vague that neither the internist nor the pediatricist has as yet given us any definite data regarding tonsillectomy as a preventive measure. Of the cures that follow tonsillectomy, some are doubtless due to causes other than the removal of tonsils. In children, the removal of the obstructive adenoids is often responsible for the brilliant results. In adults, incident to the tonsil operation there is always a certain amount of purging, fasting, bleeding, rest and dieting—measures which have been repeatedly employed for many conditions where tonsillectomy is now advised.

Thus it is evident that a decision to operate in any particular case of nonobstructive lesion of the tonsil

is a matter which requires due deliberation, as well as competent observation. Until our present indications are carefully revised, some tonsils will be needlessly removed. From the patient's viewpoint, it is highly desirable that the number of these be reduced, if possible. If only a fraction of the enthusiasm which is directed toward the perfection of the technic were diverted to this problem, the unnecessary operations would be less and even the occasional fatal occurrence reduced to a minimum.

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458 FIFTIETH STREET.

Influenza as a Primary Edema of the Respiratory Mucous Membranes and Adnexa

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During the influenza epidemics which have occurred in the past few years I have had the opportunity of making some observations and deductions concerning this infection, which I now wish to bring to the attention of my colleagues. It would, of course, be quite futile for me to attempt to cover in one article the whole subject of influenza. I shall, therefore, confine my attention to my hypothesis and the administration of a definite régime which I believe to be efficient in combating this condition. And if what I am about to say arouses criticism and discussion, I feel that it will result in a definite plan of procedure, which will aid in the successful handling of this type of infection.

At the onset of an influenza infection there is one striking feature for which I always look, and never fail to find. This is an edema of the uvula and

fauces, and the studding of the mucous membrane of the hard palate with minute vesicles. This constant finding, in conjunction with the initial onset of a very slight sore throat, has led me to believe that the invading organism—be it the Pfeiffer bacillus or a filterable virus—causes but little engorgement of the affected mucous membrane, but rather an edema of the cell protoplasm. With this observation clearly in mind I have concluded that whenever the infecting organism implants itself at any point upon the respiratory mucous membrane, the same process of invasion and resulting edema will take place.

After the presentation of this hypothesis and the deductions drawn from it, it may appear that I shall have some difficulty in proving that the influenza infection causes a primary edema of the protoplasm of the lining cells; not only of those of the

respiratory mucous membranes, but also those of the esophagus, stomach and intestines, and that it also, by direct continuity and extension through the mucous membrane of the ethmoid to the base of the brain—is capable of causing encephalitis lethargica; yet such is my intention.

BACTERIOLOGY.

I shall not here attempt to discuss the brilliant research work done by reliable bacteriologists on this subject, but will content myself with quoting the report of the special committee of the American Public Health Association.

The epidemic disease known as influenza is believed to be due to an undetermined organism which causes an infection lowering the resistance of the body as a whole, and that of the respiratory organs in particular, thus permitting the invasion of other pathogenic microorganisms. The most important complicating infections are due to the *Bacillus influenzae*, different strains of pneumococci, and various kinds of streptococci. By some careful observers certain of these organisms are regarded as the primary cause of epidemic influenza. In each case one or several microorganisms may be present. This, I find, is the consensus of opinion among reliable laboratory and clinical observers.

The influenza infection—whether it is the Pfeiffer bacillus, a filterable virus, or some yet undiscovered organism—predisposes to secondary infection. Not usually fatal in itself, it lowers the resistance of the tissue cells, thereby furnishing a culture medium for the secondary invasion by one of the streptococci or pneumococci group. This would seem to have been demonstrated by Cecil and Blake who produced in monkeys an acute respiratory disease apparently identical with influenza as observed in man, by inoculation in the nose and mouth with a strain of *Bacillus influenzae* originally isolated from a human case of influenzal pneumonia. In the inoculated animals there developed an acute, selflimited, respiratory disease of from three to five days' duration, characterized by sudden onset with profound prostration; the development of rhinitis and tracheobronchitis; with sneezing, cough, and the outpouring of a scanty mucoid or mucopurulent exudate; and a variable febrile reaction.

SYMPTOMATOLOGY.

The epidemics of 1918 and 1920 afforded most medical men an opportunity of seeing the onset of influenza in all of its many forms. However, in order to emphasize my edema theory I will briefly recall it to mind by outlining the characteristics of the ordinary onset. There is stoppage of the nose, together with a slight irritation of the throat—usually designated by the patient as a "scratchy feeling"; sometimes there is a cough, of a brassy, rough or ringing character, frequent or almost incessant, together with a tickling in the nose and throat. With the downward spread of the disease mucus begins to be expectorated, which is at first watery and gelatinous, but later becomes purulent.

This irritation was compared by Bartholomew to the irritation caused by inhalation of powder of ipecac, or the pollens of certain flowers. Recent writers have called attention to the striking similar-

ity they observed between influenza and the respiratory complications induced by the lethal war gases, chlorine, phosgen, and chlorpicrine. In both gas poisoning and influenza there is pulmonary edema and sometimes a pneumonic process, and the edema may be regarded as the response to an intense irritative reaction resulting in the loss of the normal protective mechanism of the upper respiratory tract, thus allowing bacterial invasion of the lung.

The mucous membrane may be attacked at any point to which, by reason of its anatomical position, the air can have access, that is, the nasal, faucial, bronchial or vesicular regions. The so-called gastric form of gripe arises from the extension of the process through the throat along the base, to the vomiting centre in the bulb, the irritation or shock symptoms being transmitted to the splanchnic nerve, which are anastomosed with the pneumogastric in the celiac plexus. This same irritation is also the casual factor in epidemic hiccough and mild encephalitis.

Where the frontal sinus is involved we get persistent frontal headache, and as the process extends to the opening of the Eustachian tube, the deafness so often noted. Accompanying the respiratory symptoms are the rigors—usually described as "creepy, chilly sensations," likewise periods of flushing and perspiration. Invariably the patient is drowsy and apathetic. In a great many cases the prostration is out of all proportion to the extent of the initial lesion. High temperature and chills are often present, although there are some cases in which these particular symptoms are not manifested.

Characteristic clinical findings are an edema of the uvula and fauces, but usually unaccompanied by pain or redness. The clinical signs in the chest may vary from no impairment of resonance to a marked dullness (which is only present when pneumonia has set in), associated with a slight prolongation of respiration or showers of fine crepitant râles. In the epidemic of 1919 one of the characteristic features of the symptom complex was this constant finding of râles throughout the entire chest, but unaccompanied by areas of consolidation upon percussion.

PATHOLOGY.

A constant and striking feature in the pathological findings has been the amount of fluid in the lungs at necropsy. I have found some mention of this condition in every article describing the pathology of the influenza infected lungs. It is compared to a hypostatic pneumonia, the suffocative catarrh of the older writers, and referred to as a water logging of the lungs.

The description given by Lamb and Brannin of the appearance of the lungs at necropsy is so typical that I feel I cannot do better than reproduce it here.

The lungs presented a picture quite distinct from anything we have seen before. The pathological changes are certainly not those one is accustomed to expect in the ordinary lobar pneumonia; nor were they typical of bronchopneumonia. In fact, the terminal hypostatic pneumonia sometimes seen in the aged compares more nearly in gross characteristics than does either of the other two types. The lungs are voluminous and heavy. As a rule the posterior

half or three quarters of the lung was a dark purplish red, the remaining anterior portion gray or pink. That this appearance was due to the filling of the posterior portion with dark red blood could be clearly demonstrated by an anterior posterior section. The posterior portion felt uniformly firm, yet somewhat resilient. The anterior part, especially of the middle and upper lobes, was elastic, soft and air containing; here at times a discrete, irregular, consolidated area could be felt.

On section a profuse bloody exudate welled from the cut surface of the consolidated portion. With slight pressure 300 c. c. of this liquid could be drained from a single longitudinal section. That the firmest part of the lungs contained air could be demonstrated by the presence of numerous air bubbles in the exudate. Small sections from the more dense areas would barely sink in water; other sections floated.

After the surface of a section had been squeezed and washed the polygonal boundaries of the lobules could be plainly seen. A section through the anterior air containing portion—which was rather sharply demarcated from the posterior consolidated portion—revealed a comparatively dry cut surface. The cut surfaces of these isolated areas bulged slightly and were dark gray, but not hemorrhagic. A nonpurulent exudate could be expressed from the bronchioles involved. These areas were typically those of bronchopneumonia. The marked hemorrhagic edematous element was entirely lacking in this upper and anterior half of the lungs; in fact the gravitation of the blood and exudate to the posterior portion of the lungs was striking.

Here we have a picture entirely different from that found in the stereotyped form of pneumonia. But note also, that the clinical picture is different. With showers of râles found throughout the chest we would expect to find corresponding areas of dullness, but this is plainly not the case. If the primary lesion causes an edema of the protoplasm of the respiratory mucous membrane, how easily can the pathological changes be explained! First, the initial edema causes a blocking off of discrete lung tissue, which gives rise to the finding of râles, for the lumen being still patent, the air may enter and leave as long as the entire area does not become edematous. If pneumonia does occur, dullness may be elicited. Still this is not a bronchopneumonia, but rather a congealed area of protoplasmic distended cells, caused

either by irritation at the time of the initial aspiration of the invading organism, or by direct extension from the areas primarily invaded. To these areas I have applied the name congelatinous pneumonia, so as to describe the congealing of the cells together and their ultimate gelatinelike consistency. Bartholomew found some "peculiar opaque masses" in the lungs in the severer cases of influenza. . . . "Similar lesions were found in the esophagus and stomach and rather rarely in the intestines." He could offer no explanation of these "masses," but I regard them as circumscribed areas of edematous endothelial protoplasm.

Such extensive cell irritation, impairing or blocking off aeration, explains the marked cyanosis, often occurring early in these cases. It is not toxemia, but the inhibition of oxygenation in a large surface area. This goes to explain why the blood pressure is maintained despite what has been considered cardiac depression evidenced by the cyanosis, and also to explain the leucopenia even when so great an area of lung is involved.

If secondary infection occurs upon these edematous areas the pathological findings are in direct relation to the organism causing it, and the extent of tissue involved. With the hemolyticus or other streptococci growing in the ideal culture medium which the influenza organism has prepared for it, one can readily understand the destruction of the cell membrane and the release of protoplasmic fluid into the air vesicles. Suffocation, due to the rapid flooding of the previously uninvolved areas, rapidly follows, causing suffocative pneumonia or water logging. With the advent of bronchopneumonia

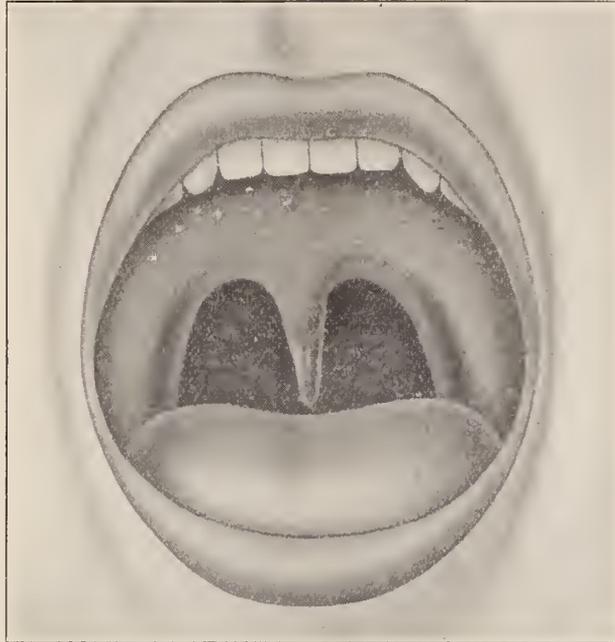


FIG. 1.—Primary influenza infection of the throat. The mucous membrane of the hard palate and fauces shows numerous discrete, glistening, slightly elevated vesicles. There is very little—if any—congestion of the membrane. The uvula is markedly elongated, the tip appearing opalescent and filled with fluid.

come the dry areas of consolidation, with the finding of hypostatic pneumonia at the dependent portion of the lung, as spoken of by Lamb and Brannin.

OSMOSIS.

In order to make clear the principles upon which I base my conception, and for a better understanding of osmosis, I will briefly set forth a description of this phenomena and its relation to the subject under discussion. Landau defines osmotic pressure as the "molecular concentration of the fluid blood plasma, without taking into consideration the red and white blood corpuscles. The osmotic pressure is equal to the pressure of serum only because the blood plasma fibrin—although an albuminous substance of high molecular weight—does not influence osmotic pressure."

Dissolved substances, as well as water, can pass from the lymph into the bloodvessels. This we know because, if all connection except that of the bloodvessels is cut off between a limb and the rest of the body, and if a solution can be injected into those vessels without injuring them, it will be completely

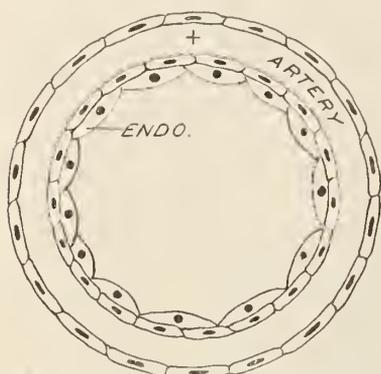


FIG. 2.—Schematic representation of oxygenation, showing relationship of pulmonary endothelium and capillary under normal osmotic conditions, and a diagrammatic illustration of air vesicle under same conditions.

absorbed. Besides the process of diffusion and the attraction power which proteids possess for water, are the processes of imbibition. All tissues—living and dead alike—have the power of taking up fluids, either by molecular imbibition, that is, by absorbing

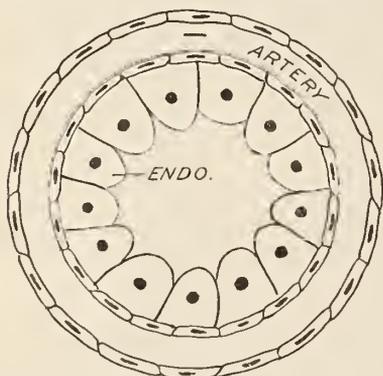
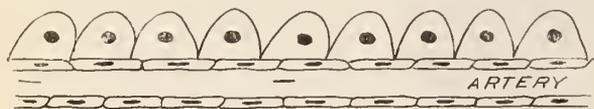


FIG. 4.—Abnormal distention of lining endothelium due to irritation; associated with a lowering of osmotic pressure in the capillary. Partial occlusion of the air vesicle resulting from protrusion of the distended endothelium into the lumen, thereby inhibiting proper oxygenation. It is the multiplicity of this condition that inhibits aeration and causes cyanosis.

fluids, through homogeneous substances; or by capillary imbibition, that is, through discrete pores.

Hamburger supposes that by imbibition of the first kind, fluids are absorbed by the homogeneous cement substances between the endothelial cells lin-

ing the peritoneum, and by the same process the fluid is passed on into the subepithelial connective tissue. Also that the cement substances between the endothelial cells of the capillaries act in the same way, and by means of the minute lumina of the capillaries assist in draining the abdominal cavity. This power of imbibition, however, is limited, and a given quantity of tissue can take up only a certain volume of fluid. But the absolute equilibrium of osmotic pressure within the whole organism must be upset the instant the osmotic pressure at any one place is changed by the introduction of a solution or the deposition of new molecules. If the osmotic pressure in a cell is raised by an increase in the number of molecules dissolved in it, the following phenomena will ensue: 1. If the cell walls are perpetually permeable to salt molecules, these molecules in their

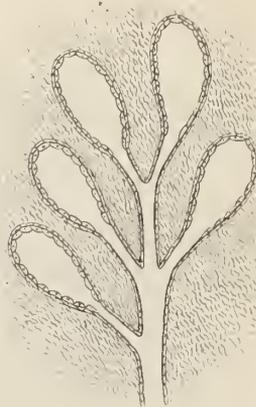


FIG. 3.

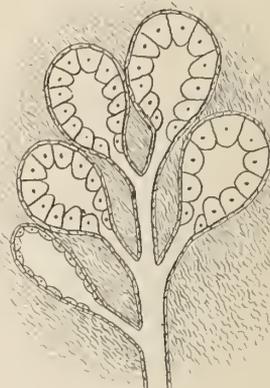


FIG. 5.

FIG. 3.—Normal vesicular arrangement which makes up lobule of lung.

FIG. 5.—Several partially occluded air vesicles which give rise to the finding of rales, unassociated with consolidation. It is to this pathological condition that I have applied the term "congelatinous pneumonia," and that R. Bartholomew has referred to as "opaque masses." Note that with positive osmotic pressure in the endothelial cells the intraarterial tension is negative. By causing a reversal of this tension the cells shrink to normal.

endeavor to diffuse uniformly, will wander out of the cell, that is betake themselves from a place of higher concentration to a place where concentration is lower, until equilibrium again prevails everywhere. 2. But if, on the other hand, the cell wall is impermeable to these molecules, in their endeavor to diffuse they will exert pressure upon the cell wall, thereby causing water to pass from the secondary medium into the cell. Therefore, the least change in the osmotic pressure in a single cell will result in some kind of movement of substance. In a given cell complex the currents of the individual cells, if they proceed in the same direction, will be fused; if they proceed in opposite directions they will be weakened or will neutralize one another.

TREATMENT.

Having presented my observations that the invading organism causes a primary edema of the protoplasm of the cells in the respiratory, brain and gastrointestinal tracts, I shall now show that by increasing osmotic tension in the pulmonary arterial system, fluids are removed from the endothelial protoplasm, rendering the cells less liable to a secondary invasion by the streptococcic or pneumococcic group.

With this hypothesis in mind, let us glance back-

ward and examine the treatment of some of the earlier clinicians.

R. Johnson in his thesis on influenza, written in 1806, was very enthusiastic regarding the employment of blood letting, catharsis, blisters and salt baths. J. B. Bryan in 1837 describes the almost immediate relief of symptoms in the 150 cases he had bled, also making use of tartar emetic, purges and blisters. While he did not attribute his excellent results to anything in particular, to me it is obvious that by increasing the pulmonary arterial tension by bleeding, purging and counter irritation, he deprived the lung tissue cells of their fluid, by calling upon them to reestablish the equilibrium of osmotic pressure. In Thompson's *Annals of Influenza* (1851-2) Dr. Graves observes that the cerebral type was markedly relieved by bleeding, purges and application of leeches. The literature of this period would seem to indicate that this condition was then more frequently treated by blood letting than at any time before or since.

Though the work recently done in an endeavor to produce a specific serum for influenza has so far failed to achieve the desired end, the results obtained seem to me to offer a most decided proof of the soundness of this edema theory. The first work on serum therapy that came to my attention was that of McGuire and Redden, who reported the results of convalescent human serum used in 151 cases. Although these results were clinically satisfactory, tending to shorten the duration of the influenza pneumonia, the outcome was not different from that obtained by Lamb and Brannin when they employed nonspecific serum (antimeningococcic, antitetanic, antidipteric and typhoid). One thing noteworthy in McGuire and Redden's work was the practice of administering the serum as early as possible, and if no fall in temperature followed the first dose, to give successive doses until a reaction was obtained. Within a period varying from thirty minutes to several hours following the administration of the human serum, the patient would show signs of improvement. Sometimes there was a chill, always a profuse sweating, upon the occurrence of which the toxic symptoms subsided and the temperature came down. The authors designate these cases as influenza pneumonia, and describe them as having either small areas of consolidation accompanied by râles, or as having no consolidation at all.

I do not regard this stage as a pneumonia, but rather a primary edema of the cells, and my explanation of the results obtained by these authors is that by increasing the osmotic tension in the pulmonary arterial system they deprived the edematous cells of their fluid. Any form of serum which causes the patient to sweat profusely would have given the same results. The different kinds of serum employed by Lamb and Brannin never gave any results unless a sweat was obtained following the chill. Apparently there was no specific action of any special type of serum, the outcome depended wholly upon the serum's protein content. I maintain that no matter what form of serum may be employed there will be no satisfactory effect unless accompanied by loss of fluid through the skin. As in meningitis, where the appearance of the urticarial

rash is accompanied by a drop in temperature and the subsidence of the cerebral symptoms, so in this condition the skin acts as a safety valve. This phenomenon will also occur in encephalitis lethargica if considered as an edema and treated by the removal of fluid, as I regard this as a direct extension from the ethmoid to the base of the brain, and the characteristic symptoms will appear as the nerves are attacked from anterior to posterior, the faculties returning as the edema subsides back to front.

In all the findings I have quoted, it is clear that there is no favorable result obtained unless there is a removal of fluid of some kind (dehydration). With each tendency to recurrence of symptoms and readministration of serum, the same reaction took place, and a further removal of fluid occurred with concomitant blood concentration and increase of intraarterial tension. In Redden's group the patients showing a secondary streptococci infection derived no benefit from the serum and died. Here the rupture of the cell membrane had permitted an accumulation of fluid which could not be removed by osmosis, because of its escape into the air vesicles (flooding).

Following this work on serum therapy came the intravenous injection of hypertonic glucose solution, which was employed by Wells and Blankinship, who obtained markedly beneficial results from the administration of a ten per cent. solution. They report an improvement in the pulse volume, which I contend was probably due to an increase in the arterial fluids because the lung tissue cells were deprived of their fluid, the relief coming, not by diaphoresis, but by an increase in the urinary output. I feel that the work of these authors offers more support to the theory of the primary lesion being an edema, and the possibility of its removal by osmosis through arterial hypertension, than do the results obtained with serum therapy. A number of physicians have been successful in the use of concentrated bicarbonate of soda solutions employed as rectal irrigations. And those who are familiar with Cushney's theory of catharsis will readily see that by the withdrawal of fluid through the bowel there occurred a concentrated blood stream which replenished itself by taking water from the tissue cells wherever it could be most easily released. How often have we observed the marked improvement following the onset of menstruation. Here again, because of the congestion of the pelvic organs and depletion of the blood stream, the chest was relieved of its edema.

Landau mentions the importance of the kidney as a regulating agent of the osmotic pressure. He observed that if the renal function was stopped for twenty-four hours the coagulating point of blood would drop from 0.56 to 1.06 or even 1.31. In normal kidney function, the kidneys operate against such excessive increase of molecular concentration by secreting the excess of solid molecular from the blood and keeping the osmotic pressure nearly constant. Functional renal disturbance, however, is sure to cause diverse changes in the osmotic pressure. When the kidneys are not capable of performing the task assigned to them, an excess of nonsecreted molecules is found in the blood, and

concentration is increased. The organism, however, strives to maintain a constant osmotic pressure, and brings into action certain regulating functions for preventing osmotic pressure changes. These functions are limitations of metabolism and retention of water in the blood.

It will be seen that my idea of the primary edema in influenza is exactly contrary to that of Henry A. Christian, who believes that practically all persons ill with influenza have a bronchial pneumonia. Happy results have followed my use of an almost empiric form of treatment in both mild and serious cases of this infection, seen in either early or late stages. My endeavor was to relieve the edema by diaphoresis, diuresis and slight purging, and I insisted upon absolute bed rest, never permitting the patient to leave his bed to go to the toilet, or even to rise on his elbow to take nourishment, thus avoiding the remotest possibility of chilling and a consequent decrease in peripheral circulation. I employed a simple and easily obtained combination of medication, salicylates to cause sweating, caffeine to stimulate urinary secretion, codeine for drying. With this I ordered counterirritation applied to the chest for a period of fifteen to twenty minutes at four hour intervals, for the purpose of increasing the peripheral circulation.

I do not hesitate to state that I believe the layman who ingested a large quantity of alcohol, went to bed and perspired freely, did more for himself in aborting the initial onset of influenza than the medical fraternity has ever realized. Likewise I feel that a great deal of harm has been done by the use of expectorant mixtures which cause a release

of the encapsulated fluid which, being released, floods the air vesicles and gives the picture of hypostatic pneumonia, which cannot be removed by osmosis.

CONCLUSIONS.

1. Whenever the infecting organism of influenza implants itself upon the respiratory tract there will be a definite objective edema, such as is always in evidence on the uvula and fauces at the initial onset of the disease.

2. Pathologically, it has been demonstrated that large amounts of fluid are present in the lungs and that they present an entirely different picture from that of bronchopneumonia. There is a congealed area of protoplasmic distended endothelial cells, which I have called congelatinous pneumonia.

3. Osmosis is a definite accepted phenomenon, and the response of the organism to changes in the osmotic pressure has been clinically demonstrated.

4. Bleeding, the administration of immune or non-specific serum, glucose injections, colonic irrigation, diaphoresis, menstruation, all serve to remove fluids, that is, are agents of dehydration, thereby increasing intraarterial osmotic tension.

5. Therefore, any treatment which brings about dehydration and causes blood concentration will, by osmosis, remove the fluid from the edematous protoplasmic cells of the lung tissue, brain or gastrointestinal tract.

6. I believe that therapy directed to this end has and will prove a positive, if not almost a specific, means of treating this type of infection.

156 WEST EIGHTY-SIXTH STREET.

Symptomatology of Influenza*

By JOSEPH C. REGAN, M. D.,
Brooklyn.

The recent pandemic of influenza, which visited New York city in epidemic form in the fall of 1918, was so extensive and the morbidity so great that hospitalization was a more or less routine procedure. The Kingston Avenue Hospital received 1,250 patients from September 16th to November 10th, a period of less than two months. (The majority of admissions were men in the service, coming in from the Brooklyn Navy Yard.)

In order to determine approximately the relative frequency, duration and severity of the various subjective symptoms in influenza, histories were taken from a hundred unselected adult male patients following a uniform questionnaire. The information obtained relative to these various points in this small series of cases is given in the following text.

Headache was mentioned by all of the patients. In over seventy-five per cent. the duration of this symptom was between one and four days, and in seventy per cent. between two and four days. It

began in almost all cases on the first day of the disease. The headache was described as frontal in sixty-five instances, occipital in six, generalized in nineteen and confined mostly to the top of the head in five. The pain was defined as dull in sixty instances and sharp in twenty-three.

Backache occurred in seventy cases. The average duration was between two and three days. The pain was specified as being severe in seventy-six per cent. and slight in twenty-four per cent. In character it was usually a dull aching pain localized mostly in the lumbar region (in over seventy-seven per cent.). It was uniformly distributed along the spine in three instances. Pain in the neck was noticeably severe in seventy per cent. of the cases. General soreness all over the body was complained of by twelve per cent. of the patients.

Thirty-four patients suffered from pains in the limbs, which were in most instances moderately severe. In twenty-eight of the thirty-four cases the pains were present in both the arms and legs in eleven, and in the legs alone in seventeen. Pain in

*Indicated by One Hundred Case Histories. From the Kingston Avenue Hospital of the Bureau of Hospitals, Department of Health, New York City, Dr. Robert J. Wilson, Director.

the joints were experienced by fourteen patients. In two cases the pain was limited to the shoulder joint, in two others to the knee joint, and in two more to the hip joint. Pain in the abdomen was complained of by four patients, and pain in the chest by nine.

Nosebleed was noted by ten patients. The frequency was on an average of once or twice daily for one or two days. In one instance it persisted off and on for five days. Packing was not infrequently required.

Vomiting occurred in twenty-three per cent. of the cases. It began on the first, second or third day of the disease and persisted from two to four days in nineteen of the twenty-three cases. In four patients it lasted over five days. The frequency of vomiting varied. In fifteen instances it occurred between two and four times daily, and in two, between six and seven times.

Diarrhea was said to have been noted in twenty-four patients, starting as a rule on the second or third day. As many of the patients had taken a cathartic with the onset of the disease it was difficult to place the exact frequency of this symptom. Inasmuch as the duration was between two and four days in twelve cases, probably the latter figure, i. e., twelve, would be the more correct one. The frequency of the bowel evacuations varied, but the average was between three and four times a day in eleven patients. In three cases they occurred seven times daily.

Sore throat was mentioned by sixty-four patients beginning on the first, or occasionally the second day of the disease. The average duration was between two and three days. The severity was given in forty-three instances as slight in twenty-seven or sixty-two per cent., and moderate in sixteen or thirty-eight per cent. In eighteen cases the symptom was limited to a dryness of the throat and pharynx. Cough was uniformly present in every patient. It was commonly noticed on the first day of the disease. The average duration was between two and four days (in twenty-six of the forty-three cases in which it was given). The cough was considered to be slight in thirty-nine, and severe in forty-two. It was dry in twenty-seven and productive in forty-eight (sixty-four per cent.). The expectoration was mentioned by forty-two patients, as scant in sixteen and profuse in twenty-six. The character of the cough was gagging with a tendency to produce vomiting in thirty-six cases.

Secretion of eyes was observed by twenty patients. It was mentioned as slight in seven and moderate in thirteen. The average duration was between two and three days. This symptom usually appeared with the onset or during the second and third day subsequently.

Secretion of nose occurred in twenty-eight cases. It was slight in thirteen, and moderate in thirteen. This symptom was noted on the first day of illness as a rule, occasionally it began on the second day. The duration was on an average between two and three days; in a few patients it persisted until the fourth day of the illness.

Chills were experienced by fifty patients. With a few exceptions they occurred with the onset, on

the first day of the disease. The chills persisted at frequent intervals for between one and two days in about seventy per cent. of these patients.

Dizziness or vertigo was noticed by twenty-nine patients usually appearing on the first day of illness while the patient was still up and around. The average duration was two to three days. It was not as a rule severe.

Perspiration was profuse in eighteen of the twenty-three patients in whom it occurred.

Previous history of influenza was only obtained in three instances.

RÉSUMÉ.

1. The only symptoms which were absolutely constant in all the one hundred cases of influenza, were headache and cough. The majority of patients had also backache (seventy per cent.), sore throat (sixty-four per cent.), and chills (fifty per cent.). The remaining symptoms may be listed in their order of frequency as follows: Pain in the limbs (thirty-four per cent.), dizziness or vertigo (twenty-nine per cent.), secretion of nose (twenty-eight per cent.), vomiting (twenty-three per cent.), perspiration (twenty-three per cent.), secretion of the eyes (twenty per cent.), pains in joints (fourteen per cent.), diarrhea twelve per cent., general soreness of the body (twelve per cent.), nosebleed (ten per cent.), pain in the neck (seven per cent.), pain in the abdomen (four per cent.).

2. The symptoms usually appearing on the first day of the disease were chills, headache, backache, secretion of nose and eyes, cough, and vertigo.

3. The duration of the headache was commonly from two to four days, and it was usually frontal in location and dull in character.

4. Backache lasted from two to four days. The pain was usually severe, and of a dull aching character localized mostly in the lumbar region.

5. The cough of influenza persists as a rule for two to four days. It is commonly severe and productive in character, with a fairly profuse expectoration.

6. Sore throat was fairly common with the onset of the disease.

7. Chills occurred in half of the patients.

8. Pains in the limbs were frequent (one third of the patients) and were in most instances moderately severe. The legs were involved much more frequently than the arms (more than twice as often).

9. Secretion of nose was always slight or moderate and began with the onset of the disease.

10. Secretion of the eyes was commonly slight or moderate. It lasted as a rule for two to three days.

11. Dizziness or vertigo was usually not severe and did not persist more than two or three days. It usually appeared on the first day of the illness while the patient was still up and around.

12. Vomiting started most often on second or third day of the disease and lasted from two to four days.

13. Diarrhea usually appeared upon the second or third day of the disease. The average frequency was three to four bowel evacuations a day and the duration was between two and four days.

14. Nosebleed occurred in a minor proportion of the patients (ten per cent.).

Editorial Articles

THE PSYCHO-CHEMICAL TREATMENT OF PULMONARY TUBERCULOSIS.

Chronic pulmonary tuberculosis is treated in various ways, although it must be confessed with no great success in any one direction. Antituberculous serotherapy, from which much was hoped and much predicted, has by no means fulfilled the glowing promises by which it was ushered in. As a matter of fact, tuberculin treatment based on the principle of active immunization has been losing ground. In short, tuberculin, not exerting any specific action and being only partially remedial, can never count for much in the treatment of chronic pulmonary tuberculosis and, in addition, is only available in a limited proportion of cases. Chemotherapy seemed to have a great future in the treatment of tuberculosis, but here too our high hopes have not been realized. However, it must be admitted that when more is known concerning the action of the ferments and of physical chemistry, it is likely that chemotherapy will be found to be of value in the treatment of pulmonary tuberculosis. Researches in this direction are being actively prosecuted in various parts of the world, the results of which may open up a new and fruitful field of treatment of disease in general including, of course, chronic pulmonary tuberculosis.

Up to the present time, however, medicinal aid has failed, except as an alleviative measure in some stages of pulmonary tuberculosis, and the same may be said, with some reservations, of surgical measures. Artificial pneumothorax is in some cases an extremely valuable procedure, for, while it is not often curative in its action, it does stay the progress of the disease, its effect being somewhat similar to an operation for cancer.

In the *Medical Press and Circular*, October 5, 1921, Dr. Louis Renon, professor agrégé at the Faculty of Medicine of Paris, discusses the treatment of chronic pulmonary tuberculosis by psycho-chemical means. Dr. Renon lays down the axiom that every new method of treating chronic pulmonary tuberculosis, provided it is harmless, always yields satisfactory results. He points out that there is a normal coefficient of improvement attained by all the various modes of treatment, but, and here is the point, this improvement is largely due to psycho-therapeutic influence. If the physician has absolute confidence in his method he imparts this confidence to the patient, as a rule, with satisfactory results. Indeed, it is suggestion that does good and treatment is merely the vehicle of this suggestion. Rochefou-

cauld remarked that, "Hope, deceitful though she be, serves at any rate to lead us to life's end along an agreeable path." Dr. Renon draws attention to the obvious truth that the most popular phthisiotherapeutists are those who manage to acquire a salutary influence over their patients, who, so to speak, keep them well in hand and direct them in accordance with the present principles of treatment of tuberculosis and bolster up their treatment by a good dose of suggestion.

It was on the strength of these principles that he instituted what he termed the "method of successive analogous medications," that is to say, the association of the chemical action of the drugs on the disease with the psychical action which they can be made to exert on the patient. As the duration of the latter action rarely exceeds three weeks it becomes necessary to change hands at the expiration of that period, in other words, what must be done is to alter, without changing the treatment.

The method of successive analogous medication implies the use of bodies containing iron, lime, silica, arsenic, carbonates, phosphates, organotherapeutic products, and so on, but whatever the substance employed, it must first and foremost be harmless. Then, too, the drugs should be administered in small doses. Each case calls for special treatment, the details of which can be filled in differently, but it must cover a period of twenty days followed by a period of repose of from eight to ten days, during which no medicine at all is given. This is followed by successive periods of twenty days' treatment with the usual eight to ten days' respite. Dr. Renon has come to the conclusion that this period of repose is indispensable to the organism, so that tolerance may not be established. After three months of this treatment the cycle can be started afresh. The same medicinal substance is not prescribed *de novo* until three months have elapsed. The patient has not had time to get used to it, and the good effects of the first administration will be repeated. According to the clinical form of the disease and the various therapeutical indications, the details can be filled in with other substances selected from a list given in Dr. Renon's article, since in the small doses therein prescribed there is no risk whatever of upsetting the digestion.

Every physician with experience in dealing with patients suffering from chronic pulmonary tuberculosis is fully conscious of the fact that means of treating it effectively are unsatisfactory. Sanatorium

treatment, if it has not failed, at least has not given the results which were fondly anticipated and somewhat too loudly proclaimed by its supporters. Yet, although scientific phthisiotherapy has not come into its own, there remain those methods whose purpose is merely to strengthen and increase the defensive powers of the organism, such as climatotherapy, organotherapy, and treatment by fresh air and good food. These really rational measures continue to hold their own and are being placed upon a more common sense basis than formerly. Excess in any one direction has been discarded, absolute repose has been wholly abandoned, and forced feeding and overeating do not find the favor they used to find, but, after all, diet rightly chosen and a sufficiency of exercise and plenty of fresh air are still the sheet anchors of the treatment.

As for the psychotherapeutic factor of cure, there is little doubt that it is of the first importance in the treatment of disease and perhaps especially in that of the dread disease to which reference is being made. Mind has an immense effect on the physical conditions and confidence in a physician is often a long step along the path of progress.

The chemical treatment of tuberculosis has for its special object the remineralization of the organism in accordance with the principle laid down by Professor Albert Robin, to recalcify it by Ferrier's method, to brace it up and to remedy the insufficiency of the glands of internal secretion. As said before, although chemical treatment exerts no specific effect, investigations now proceeding inspire hope that it may. Robin's mode of treatment is founded on sound premises. Renon's method of successive analogous chemical medications given on psychotherapeutic principles, combined with the so-called rational treatment by fresh air, rest and good food, is an advance on his great compatriot's treatment, inasmuch as it largely depends on the influence of the mind over the body.

PULMONARY GANGRENE IN CHILDREN

The diagnosis of pulmonary gangrene in children is always difficult since none of the symptoms presented are pathognomonic. The process must be suspected when during the course of pneumonia, bronchopneumonia, or pleurisy, evidence of prostration and a hectic condition appear, with chills and very high or remittant temperature. Pulmonary gangrene may exist without the two principal elements of diagnosis being present, namely, fetid breath and expectoration, but when the former symptom is manifest the physician must ascertain with the greatest care whether it is due to a gangren-

ous lesion in the mouth—noma, dental caries, ulceromembranous stomatitis—in the pharynx, or in the larynx.

In the mouth and the pharynx the foci of gangrene are easy to detect, as well as the angina with a putrid odor so frequently met with in children. One must also ascertain with the utmost care if the odor does not possibly come from the nasal fossæ—atrophic rhinitis. When to the fetid breath there is added bloody, grayish, putrid sputum, the diagnosis is almost a certainty. There are, however, two pulmonary affections which are difficult to differentiate from gangrene, and the diagnosis is still more difficult when these are complicated by gangrene. We refer to bronchiectasis and putrid bronchitis. In the first, the breath and expectoration occasionally are very fetid, quite as much so as in gangrene, but with the difference that in bronchial dilatation the odor is stale rather than putrid. This supposed difference is frequently little marked, however, and many observers believe that the difference is insufficient for differentiating pulmonary gangrene from bronchiectasis or putrid bronchitis. From the viewpoint of diagnosis a microscopical examination of the sputum is much more important, as in pulmonary gangrene the presence of elastic fibres and bits of pulmonary parenchyma will be detected.

In bronchiectasis the expectoration takes place by matutinal intermittent evacuations more or less copious. The condition may improve but recovery does not take place, in this respect differing distinctly from circumscribed pulmonary gangrene in which there is often complete recovery. Of course diffuse gangrene of the lungs causes death in a short time. Putrid bronchitis may give rise to fetid breath and sputum, but the physical signs of pulmonary cavity are wanting.

In certain cases of tuberculosis that have reached the stage of cavity formation there may be fetid breath and expectoration, but in children from one to eight years of age lung cavities, like pulmonary gangrene, are found in the middle portion and base of the lung quite as often as at the apices. Cavities are rare during the first few years of life, but gangrene of the walls is even more infrequent. The general condition in pulmonary gangrene, with the symptoms of profound infection, are sufficiently different from the anemia and cachexia of tuberculosis to make the diagnosis clear.

There is a form of hereditary syphilis that may be confounded with pulmonary gangrene, and this all the more readily because the symptomatology of both processes has more than one point in common. We refer to pulmonary syphilis of the gangrenous form described by Dieulafoy and Fournier. In these cases

some process is developed in the lung and there is eliminated the products of broken down gummata of fearful fetidity. A mistake will surely occur if the history of the parents and the usual signs of hereditary syphilis are not looked for. Specific treatment will settle the question, likewise a Wassermann test, if the reaction is positive. This, however, may not always be the case.

One word as to radiology and exploratory puncture. The former has not been successful from the viewpoint of diagnosis, while exploratory puncture will be useless even if a pleural collection does exist, because the serofibrinous fluid withdrawn offers nothing characteristic. It is only in cases of gangrenous pleurisy that the nature of the fluid withdrawn will indicate that one or several foci of gangrene are present in the lung. Finally, it must be frankly admitted that there are too many cases of pulmonary gangrene in children in which the diagnosis is made when the case comes to autopsy.

PHYSICIAN AUTHORS: DR. EDWARD
HAZEN PARKER

Life's race well run,
Life's work all done,
Life's victory won;
Now cometh rest.

This stanza, in somewhat garbled form, is inscribed on the tomb of President James A. Garfield in Cleveland, Ohio. It is perhaps the most popular bit of tombstone doggerel ever written. One can find it in thousands of graveyards in all parts of the world, for it has been translated into many languages. The stanza was one of a set of four written by Dr. Edward Hazen Parker, who was a prominent New York physician during the latter half of the last century. The verses were written early in 1879 and printed for use at a funeral in the spring of that year. Dr. Parker's friend, Prof. William H. Crosby of Poughkeepsie, N. Y., made a translation of it into Latin, and both the original and the translation were printed, side by side, in the now defunct *New York Observer*, May 13, 1880. Dr. Parker's name was attached to the English version and Crosby's to the Latin version. But through some freak of circumstance the verses became detached from the name of the author and newspapers throughout this country and England began printing them without authorship credit, or credited to someone other than the real author. How they came into the hands of Mrs. Garfield is not known, but the copy she had of them was accredited to *Anon.* Country editors a few years back were addicted to the habit of accrediting to *Anon.* nearly everything they lifted from contem-

porary papers. The fact that the lines were used on Garfield's tomb gave them great vogue, but even before that their exceeding appropriateness for epitaph purposes had been recognized, and the stone cutters already knew them by heart. Alexandra, Princess of Wales, had had them inscribed on a stone above the grave of an old servant and friend and they had been used by many others of lesser note.

When the editor of the *Cleveland Sunday Sun* began an inquiry into the authorship of the lines claimants for the honor sprang up in all parts of the country. Other newspapers took up the matter and in course of time Dr. Parker heard of the controversy and was able easily to establish his claim to the authorship beyond all dispute.

The three remaining stanzas of Dr. Parker's poem, as printed in the *New York Observer*, were as follows:

Sorrows are o'er,
Trials no more,
Ship reaches shore;
Now cometh rest.

Faith yields to sight,
Day follows night,
Jesus gives light;
Now cometh rest.

We awhile wait,
But, soon or late,
Death opes the gate,
Then cometh rest.

It will readily be seen that the first stanza, with its monosyllabic Saxon, besides being admirably adapted to epitaph purposes, also is the best stanza of the four. As a tribute it covers the ground fully. The rest is tautological and to some extent beside the mark.

Beyond this single poem, and a few other verses of similar character which have not been preserved, Dr. Parker wrote nothing, except what he wrote in his capacity as a medical editor. He was a physician and surgeon of great prominence in New York for half a century, up to the time of his death in 1896. He was born in Boston, Mass., in 1823 and was graduated from Dartmouth College in 1846. Two years later he got his medical degree at Jefferson Medical College, and was at once appointed lecturer on anatomy and physiology at Bowdoin Medical College at Concord, N. H., where he also undertook the editorship of the *New Hampshire Medical Journal*, which he conducted successfully for nine years. He left Concord in 1853 to accept the chair of physiology and pathology in the New York Medical College. During the three years that he held this professorship he established the *Medical*

Monthly (1854) and continued as its editor for many years. During part of that period he also was co-editor of the *Journal of Medicine* at Concord. In 1858, through the solicitation of many friends and patients, he was induced to remove to Poughkeepsie, N. Y., where he practised medicine up to the time of his death.

THE NEW BIBLE

H. G. Wells, in his proposed twentieth century *Bible*, reserves an important place for sanitary science. He points out that the *Bible* which he would replace contains much that bears on the subject of health of body, as of mind, from the Mosaic rules concerning the disposal of sewage and the classification of foods down to the Reclabite teachings of temperance (or abstinence) from alcoholic drinks.

Much of this sanitary section of the great *Bible* is obsolete from a modern viewpoint and for modern purposes, but the spirit of hygiene still pervades the old pages in a large way. The *Bible* is, or was, a changing collection of condensed works on various subjects—historical, poetical, legal, ethical, religious. Many of them have been omitted, from time to time, as “uninspired,” while others, which seemed to the compilers of the age deserving of admission, have been added.

A modern *Bible* of this sort would be a most unwieldy affair, and we fear that the Book of Hygiene and Sanitation would be hard to write. Still, the general principles of both subjects might be condensed into small compass, and would they not fall under two heads, the titles of which Cleanliness and Temperance sound old-fashionedly biblical? The problems of sanitation are still the observation of rules of cleanliness, but now bacterially rather than in the old dogmatic sense, established vaguely through totem worship and other accidental taboo; we must have clean water, clean milk, clean air. In personal hygiene, the preservation of bodily cleanliness, inside and out, comes near covering the essentials of conduct, and as for sexual health, cleanliness covers the whole ground.

Should not the modern school curriculum contain the modern *Bible*? In other words, should not our school textbooks cover the field of modern science and literature, as did the older *Bible* in a time when religion was more anthropomorphic? Certainly hygiene and sanitation should be an essential of this educational *Bible*, but we are a long way from attaining to their admission to such a place of dignity as they deserve, or such as they held in the Pentateuch.

THE NATIONALITY OF SURGERY

The following is an excerpt from an editorial concerning Dr. Lorenz's reception in America, which appeared in a recent issue of the *Sun*, New York, which expresses an attitude at variance with that held by many physicians in this country.

The physician's earlier doubt as to how he would be looked upon in a nation that recently was at war with his country indicated a misapprehension. We do not in this country harbor indiscriminate grudges against the people of Germany and Austria. Our promptness in sending food after the armistice showed that. Especially do we not feel animosity toward an individual whom, like Dr. Lorenz, we knew and held in utmost respect and gratitude long before a military venture at Berlin had brought distress upon Europe. Americans desire the recovery of the Central European peoples, and they desire the kind of reconciliation that such humanitarian activities as those of Dr. Lorenz should further. The world has seen too much of destruction to retain any belated ill feeling toward those who devote their lives to healing wounds and saving lives.

When we recall the fraternal courtesy shown by physicians of the warring countries to each other during hostilities, it would be well to take a broader view of the situation. The writer of this editorial was a prisoner of war in Vienna, where he was operated upon with great skill by a Viennese surgeon and received every care and attention possible. Perhaps if some of the more critical had had more actual experience they would not cling to the hysteria of the past.

NOT OF THE GROUP

Of the personnel of group medicine which we have happened to see, there has not appeared anyone familiar with the use of massage and medical gymnastics. Is this old and most important branch of treatment to be neglected in group, as it has been in individual, practice? Are we to run chiefly to diagnosis, pills and powders, while under various offensive names the nonmedical who are interested in the laying on of hands thrive and prosper and do good?

Some ten years ago the dean of one of our most respected medical schools, in his annual report, stated that it was high time to establish a chair of treatment of disease by physical means. The chair has never been established. This represents the inertia of all the schools on this subject. Meanwhile the schools for those who apply some of these methods indiscriminately, and otherwise without judgment, turn out a host of those who profit by our medical stupidity.

What the patient wants is to get well, or at least get better, and most chronic invalids are such from lack of exercise of mind or body. If they prefer

passive exercise and are willing to pay for it, they should have it from a hand that can prescribe it in the safest way. But there are many other patients, medical as well as surgical, who will profit greatly from mechanotherapy.

If the physician does not care to use his own hands, he can have the services of a trained masseur or masseuse, and in group medicine there is an excellent opportunity to have such a trained assistant as full time worker. There is no excuse for allowing patients who have "much or little the matter with them" from falling into the hands of "adjusters" of the vertebral column.

THE USE OF VITAMINES.

Careful workers in medicine have found many therapeutic uses for vitamins. As in the case of many other medicinal products, manufacturers more interested in profits than in results tend to exploit their wares before the public. This tends to lead the lay public to self-treatment. Frequently mistakes are made and a serious disease progresses beyond the point where it may successfully be treated by the physician. This situation has arisen in regard to vitamins. The market has been flooded by numerous products and the appeal is made directly to the lay public. There are certain carefully made vitamin products, designed for medicinal use under the direction of the physician, where clinical data may be secured and accurate observations obtained. It would be folly to discard a valuable therapeutic aid because of certain widely advertised purely commercial products. It would be wise for the practitioner to choose his products with care and cooperate with the reliable manufacturers of standardized vitamins who are attempting to distribute their products through the practicing physician.

News Items.

Harvey Society Lecture.—Dr. Clemens Pirquet, professor of pediatrics, University of Vienna, will deliver the third Harvey Society Lecture at the New York Academy of Medicine, Saturday evening, December 17, 1921. His subject will be Nutrition Treatment of Tuberculosis in Childhood.

Smallpox in Kansas City.—According to Public Health reports, 127 cases of smallpox, with 39 deaths, occurred in Kansas City, Mo., during the period October 10th to November 10th. It is reported that the majority of the cases are of the hemorrhagic type.

Civil Service Examination for Bacteriologist.—The New York State Civil Service Commission announces an examination on December 10 for the position of bacteriologist at the State Hospital for Incipient Tuberculosis at Raybrook, N. Y.; salary, \$2,000 a year and maintenance. An examination will also be held on the same date to fill the position of laboratory assistant in bacteriology, Division of Laboratories and Research, State Department of Health; salary, \$1,500 a year.

To Raise London Hospital Fund in America.—Two students from St. Bartholomew's Hospital, London, are coming to America to raise money to help this hospital to clear up its debts which amount to about £10,000.

Dr. Lorenz in New York.—Dr. Adolf Lorenz, of Vienna, is holding a series of clinics in various hospitals in New York. He will remain here until after Christmas, when he will go to Chicago and other cities in the West and Middle West.

Sheppard-Towner Bill Approved by House.—On November 19th, the House passed in amended form the Sheppard-Towner Maternity bill, previously approved by the Senate. The measure now goes to conference. The vote was 279 to 139.

Wine and Beer Not Medicines.—The Willis-Robinson bill, forbidding the use of wine and beer as medicines, has been signed by President Harding. The regulations recently issued by Secretary Mellon, permitting the prescribing of wine and beer as medicines, are thus automatically revoked.

Hospital Week.—Fifty-seven nonmunicipal hospitals in New York started a drive on Tuesday, November 29th, to raise a fund of \$1,000,000. The money will be used to defray the expenses of free patients in the institutions included in the fund, most of which are facing deficits caused largely by giving free treatments.

American Physicians Honored.—The Royal College of Physicians of Edinburgh recently conferred membership on Admiral William C. Braisted, of Washington, and Dr. Walter L. Bierring, of Des Moines, two prominent members of the National Board of Medical Examiners. It is said that this is the first time honorary memberships have been conferred by this institution since 1809.

Gift to Mt. Sinai Pathological Laboratory.—Mr. Adolph Lewisohn has given \$150,000 to Mt. Sinai Hospital for the pathological laboratory. The gift was in addition to others to the hospital and laboratory made by Mr. Lewisohn, including a similar amount when the laboratory was founded. The new \$150,000 fund will be known as the Adolph Lewisohn Foundation.

Medical Officers Receive Distinguished Service Medals.—President Harding has presented the Distinguished Service Medal to Dr. John J. Moorhead, a former emergency officer in the Medical Corps and a colonel during the war, Colonel J. R. Kean, Colonel Henry A. Shaw and Lieutenant Colonel Foster, of the Medical Corps, United States Army, for distinguished service with the American Expeditionary Forces in France.

New Officers of American Public Health Association.—The following officers were elected at the fiftieth annual meeting of this association, held in New York November 14th to 18th: President, Dr. Allen J. McLaughlin, assistant surgeon general, United States Public Health Service; first vice-president, Dr. Haven Emerson, of New York; second vice-president, Dr. Alfonso Pruneda, head of the National Department of Health of Mexico; third vice-president, Dr. Royal S. Copeland, health commissioner of New York; executive secretary, Mr. A. W. Hedrick, of Boston; treasurer, Dr. Roger I. Lee, of Cambridge, Mass.

Jenner Memorial Medal Awarded.—The Royal Society of Medicine has awarded the Jenner Memorial Medal to Sir Shirley Forster Murphy, in recognition of his distinguished work in the prevention and control of epidemic disease.

Nobel Prize in Chemistry.—Professor Walther Nernst, of the University of Berlin, has been awarded the Nobel prize for 1920 in chemistry. The prizes in chemistry and physics for 1921 are being reserved. Dr. Nernst, in addition to being director of the institute of physics and chemistry at the University of Berlin, is a Fellow of the Berlin Academy of Science.

Dietitians Needed in United States Public Health Service.—The United States Civil Service Commission states that there is need for a considerable number of dietitians in the Public Health Service at hospitals throughout the United States and that until further notice it will receive applications for such positions. The basic entrance salary offered is \$960 a year with possible promotion to the basic pay \$1,344 a year.

Gorgas Memorial Planned.—The movement to establish in Panama City the Gorgas Memorial Institute of Tropical and Preventive Medicine, in memory of the late Surgeon General Gorgas, has received the endorsement of the American College of Surgeons, the American Public Health Association, and other medical organizations. The site for the memorial has been offered the United States by the president of the republic of Panama, in acknowledgment of the work of the late General Gorgas. The directors of the memorial hope to raise between three and five million dollars.

Personal.—Dr. L. T. Le Wald announces the opening of an x ray laboratory in the Medical Chambers Building, 114 East Fifty-fourth Street, New York.

Dr. Arthur Dean Bevan, of Chicago, has received from the French Government the order of the Legion of Honor.

Dr. Charles W. Pilgrim has tendered his resignation as chairman of the New York State Hospital Commission, to become effective on December 12.

Dr. Henry Reiter has been appointed a member of the board of examining surgeons for the Department of the Interior Bureau of Pensions, and has been assigned to duty in New York.

Dr. Orrin Sage Wightman was elected president of the Medical Society of the County of New York, at the annual meeting of this society held on November 28th.

Died.

APPLEBACH.—In Philadelphia, Pa., on Wednesday, November 16th, Dr. Henry E. Applebach, aged fifty-eight years.

ARMSTRONG.—In Atlanta, Ga., on Sunday, November 6th, Dr. Milton N. Armstrong, aged seventy-two years.

BARNES.—In Columbus, Ohio, on Sunday, October 23rd, Dr. Albert S. Barnes, aged fifty-seven years.

BARR.—In Clinton, Mo., on Monday, October 31st, Dr. Bernice Barks Barr, aged sixty-four years.

BARR.—In Rochester, N. Y., on Friday, November 4th, Dr. Roy L. Barr, of Collins, N. Y., aged thirty-seven years.

BARTOLS.—In Dorchester, Mass., on Wednesday, November 9th, Dr. Lillie A. Bartols, aged forty years.

BELL.—In San Diego, Cal., on Thursday, November 3rd, Dr. George Bell.

BOSWELL.—In Mounds, Ill., on Sunday, October 23rd, Dr. Charles James Boswell, aged forty-five years.

BOYD.—In Larchmont, N. Y., on Thursday, November 10th, Dr. James P. Boyd, aged seventy-three years.

BRADLEY.—In Waverly, Ill., on Tuesday, November 1st, Dr. George W. Bradley, aged eighty-three years.

BURNS.—In Sandusky, Ohio, on Friday, November 4th, Dr. George M. Burns.

MURRAY.—In Syracuse, N. Y., on Friday, October 21st, Dr. Dwight H. Murray, aged sixty years.

O'BRIEN.—In Redwood, Cal., on Thursday, October 13th, Dr. Martin S. O'Brien, of St. Louis, Mo., aged sixty-five years.

OSBORN.—In Bridgeport, Conn., on Thursday, October 20th, Dr. George Wakeman Osborn, aged sixty-one years.

PATRICK.—In New York, on Tuesday, October 25th, Dr. Jehiel H. Patrick, aged fifty-four years.

PATRICK.—In West Chester, Pa., on Saturday, October 29th, Dr. Elwood Patrick, aged sixty-five years.

PHILLIPS.—In Bar Harbor, Me., on Sunday, October 9th, Dr. George A. Phillips, aged sixty-seven years.

RICHARDSON.—In Barrington, Ill., on Tuesday, October 18th, Dr. David Hobart Richardson, aged sixty-eight years.

RICHARDSON.—In Philadelphia, Pa., on Sunday, October 30th, Dr. Neafie Richardson, aged forty-eight years.

RILEY.—In Boston, Mass., on Thursday, October 27th, Dr. Elizabeth A. Riley, aged fifty-three years.

RIKER.—In Pontiac, Mich., on Saturday, October 8th, Dr. John D. Riker, aged fifty-five years.

ROBINSON.—In Warsaw, Ky., on Tuesday, October 11th, Dr. Samuel B. Robinson, aged fifty-four years.

SAYRE.—In Canandaigua, N. Y., on Thursday, October 13th, Dr. Ellis B. Sayre, aged seventy-three years.

SCHWARTZ.—In Washington, D. C., on Friday, October 28th, Dr. Herbert Woodworth Schwartz, aged sixty-two years.

SCOTT.—In Sacramento, Cal., on Sunday, October 16th, Dr. Alfred James Scott, of Los Angeles, aged sixty-three years.

SHEPHERD.—In El Campo, Tex., on Monday, October 17th, Dr. Melville Robert Shepherd, aged fifty-eight years.

SHUTTEE.—In Chicago, Ill., on Wednesday, October 12th, Dr. Henry C. Shuttee, of West Plains, Mo., aged sixty-three years.

SLOAN.—In Cowan, Tenn., on Friday, October 28th, Dr. Flavel B. Sloan, aged seventy-seven years.

SMITH.—In Camden, N. J., on Thursday, October 27th, Dr. J. Anson Smith, of Grenloch, N. J., aged fifty years.

SPENCER.—In Croghan, N. Y., on Tuesday, October 11th, Dr. Ira Darius Spencer, aged sixty-three years.

STALKER.—In Kenosha, Wis., on Wednesday, October 19th, Dr. Henry J. Stalker, aged eighty-three years.

STERRS.—In Atlanta, Ga., on Wednesday, October 12th, Dr. James G. Sterrs, aged thirty years.

STEWART.—In Homestead, Pa., on Monday, October 17th, Dr. Joseph S. Stewart, aged seventy-two years.

STONE.—In Burlington, Vt., on Friday, October 28th, Dr. Bingham H. Stone, aged forty-seven years.

ST. JOHN.—In Bowling Green, Ohio, on Wednesday, October 12th, Dr. Charles Stephen St. John, aged sixty-seven years.

TAYLOR.—In East Liverpool, Ohio, on Saturday, October 29th, Dr. William J. Taylor, aged seventy-nine years.

TONER.—In Berkeley, Cal., on Monday, October 17th, Dr. Mark Ferdinand Toner, aged fifty-three years.

WALTER.—In Reading, Pa., on Wednesday, October 26th, Dr. Robert Walter, aged eighty years.

WASHBURN.—In Augusta, Me., on Friday, October 14th, Dr. George Edward Washburn, aged forty-six years.

WHITEHOUSE.—In Chester, Pa., on Monday, September 19th, Dr. Walter J. Whitehouse, Jr., aged thirty-nine years.

WHITTAKER.—In Morven, Ga., on Sunday, September 11th, Dr. Simon T. Whittaker, aged sixty-eight years.

WILLIAM.—In Monroe, La., on Wednesday, October 19th, Dr. Epsy M. William, aged forty-five years.

WILLSE.—In Camden, N. J., on Saturday, October 15th, Dr. Hudson G. Willse, of North Bay, aged seventy years.

WOLFE.—In Cedar Rapids, Ia., on Tuesday, October 4th, Dr. John D. Wolfe, of Mt. Vernon, aged sixty years.

LONDON LETTER.

(From our own correspondent.)

LONDON, October 18, 1921.

Novelties in Medicine—Birth Control—The Virtues of Psychology.

Sir Dyce Duckworth, M. D., delivered the inaugural address at the 185th Session of the Royal Medical Society in Edinburgh on the evening of October 14th. Referring to education of the future he said that eighteen months hence it would take a student six or seven years to get a diploma. That appeared to be more time than could be usefully occupied, and whether they would succeed in turning out better men was a question they could not help doubting. He dwelt on the importance of paying attention to the individual patient, and to what his disease meant to him. For many years, he said, a great deal more attention had been paid to the diseases than to the patient. Each man and woman was different, had different parents, different nerves, and had been brought up in a different way, and the complicated nature of man rendered each patient a special study. There were, the speaker said, a great many novelties brought out which had not been sufficiently tried. Young men were trying these new things, and their minds had not been properly stored with the things that had been known to do good. He advocated the use of well tried remedies. In the wild hurry of today, it was not realized that new methods required long and serious study. These novelties were mischievous in withdrawing full confidence from the ordinary doctors and diverting attention from older remedies long approved by the skill and brains of our forefathers. Speaking of alcohol, he said science had failed to aid the physician in prescribing it in disease, but he would regard the total abolition of alcoholic liquors as distinctly hurtful to the welfare of any enlightened Christian country. On the other hand, experiments had shown that no man in health could do his work better by taking whiskey or beer during its progress. The evidence was that it diminished the output of energy, but alcoholic beverages in strictly moderate quantities might be taken, with a meal later in the day when a man's work was done, and be a refreshment to his body. Referring to the panel system Sir Dyce Duckworth said it had resulted in general failure, and had tended to lower the public respect for worthy practitioners. The medical profession had been placed in bureaucratic hands, whose tyranny was injurious to its honor, its independence and its dignity.

* * *

Lord Dawson, physician to the King, recently dropped a bombshell into the camp of churchmen when he gave expression to his views on love and marriage at the Church Congress held two weeks ago at Birmingham. He openly accused the Church of not facing the facts of life, and the main points of his arguments were as follows: You cannot suppress the influences of sex love. An outlet it will have and if that outlet is inadequate or unduly obstructed irregular channels will be found. The Church holds that sexual union shall take place only for the purpose of procreation. Love limited like

this is an invertebrate joyless thing, not worth the having. Selfcontrol has a breaking point. Sex love has, apart from parenthood, a purpose of its own. It is something to prize and cherish for its own sake, and is an essential part of health and happiness in marriage. Passion is a worthy possession. Birth control is here to stay, no denunciation will abolish it. Birth control by abstention is either ineffective, or if effective, is pernicious. It is no more unnatural to control conception by artificial means than to control childbirth by artificial means.

The Church of England takes its stand on the decision on this matter of the Lambeth Conference which met in June last year and was attended by Anglican bishops from all over the world including many from America. Its attitude is summarized in the following two pronouncements given to the *Weekly Dispatch*, a London Sunday journal, by the Bishops of Sheffield and Truro. The Bishop of Truro said that at the Lambeth Conference the bishops held that the ultimate purpose of sexual union was procreation and it was the seal of married love. The aspect of the question which Lord Dawson had in his mind was that the bishops generally were against the use of contraceptives, especially having regard to the dangers of their use by unmarried people. The presence of contraceptives simply meant the danger of sexual promiscuity. The Bishop of Sheffield thought that Lord Dawson had misunderstood the Lambeth Conference.

Sir James Barr, of Liverpool, vice-president of the British Medical Association, when interviewed on the subject said that Lord Dawson was late in the field, as the views he had enunciated had been held by the neomalthusians for over half a century. At the present time half of the generation were being produced by a low stratum of society and their children were being kept by the charitable. These people who lived from the cradle to the grave on charity often lived longer than honest, hard working men. If you could guide sexual intercourse in the proper direction and encourage early matrimony and small families, the result would be that you would have a better population and the people composing it would be able to support their families and would not have to support the families of degenerates. What we wanted was a healthy and industrially active population. Why should indiscriminate procreation be limited to the lowest strata, with the result that we were breeding unemployables? If we had a healthy race there would be plenty of work for everybody. A great many children were brought into the world scarcely capable of living. An enormous number died before they were of any economic value. Families of the better class and the intelligent artisan were too small simply because the parents could not support their own families and other people's as well, and the father was taxed out of existence. If women of the poorer class had the knowledge of the means of birth control which had been possessed by the upper classes for the past thirty or forty years, the probability was that they would not handicap themselves in this manner in the battle of life. Furthermore, many of these children got no maternal love. A population we could support was what we wanted. A tre-

mendous population tended to make the wealthy wealthier and the poor poorer. A healthier population would mean a wealthier population.

Mr. E. B. Turner and several other well known physicians and surgeons agreed in the main with the opinions set forth by Sir James Barr, although they did not speak with his vigor and outspokenness. Mrs. H. A. L. Fisher, wife of the Minister for Education, gave a qualified approval of Lord Dawson's pronouncement. She said that although there were still many who shrank with horror from any public dealings with such questions, the rest were coming more and more to feel that nothing but good could result from honest, open, and above all, informed discussion of problems which were of such vital importance not only to individuals but to the community as a whole. For upon their right understanding, the future of the race largely depended. It was known that birth control was largely practised and that its use was increasing. What was not known, and what none but doctors could tell with authority, was whether its practice was good or bad, and whether that in turn depended upon the methods adopted. We were beginning, moreover, to suspect that there had been and was still, an incredible amount of misery, a vast sea of suffering, both physical and mental. On the one hand, we had indiscriminate, almost animal, parenthood. On the other, nerve strain and perhaps breakdown. Given good health and adequate means, there could be nothing better than a large family. On the other hand, nothing could be worse than the large family which was the result of uncontrolled, unguided instinct. Probably few of the children survived, and of those who did a considerable proportion would be damaged or undeveloped. Most of them felt that marriage without parenthood was imperfect, that the greatest gift of all was withheld. Most of them felt, too, that the only child, although it was infinitely better than no child, was handicapped, deprived of its rightful heritage. But the greater number of couples under modern conditions could not envisage more than three or four children. How then were they to behave. Here surely was the most vitally important question. Sentimentality, prudence, convention, even our instinctive desire to protect the closest intimacies of human life from publicity, might stand in the way. But they could not but be grateful to those who gave them scientific knowledge and accurate information.

The question of birth control is one of the most insistent of modern civilization. The more civilized the country, or rather the higher the degree of culture reached in a country, the more is birth control practised. France is the most cultured country of the world and seldom in the upper and middle classes are there more than two or three in a family. The middle class of America is for the most part a cultured one and the birth rate of this class is strictly limited. In Great Britain, the birth rate of the best stock has been steadily falling for years. The menace that looms ahead is that the comparatively useless part of the population, on account of its relatively large birth rate, will in the course of time swamp the intelligent, intellectual and industrious portion. It will be a survival of the unfittest instead of the fittest. A similar problem, of course, presents itself

in America and perhaps in an even more accentuated form than in this country. Quality is worth more than quantity in human beings as in most other things, and the object should be to increase the birth rate among the healthy and decrease it among the degenerates and near degenerates. One point of importance was not touched upon in the discussion of the subject here, and that is the increasing unwillingness of the modern woman to bear many children. They do not wish the bother and responsibility of a fair sized family, and will not consider those of a big family. The modern woman does not, as a rule, possess the domestic virtues and absolutely refuses to bear many children. The pros and cons with regard to birth control are many and it would be of great interest here to learn the views of American physicians on the subject.

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Sir Frederick Mott, in the course of his presidential address at Charing Cross Hospital on October 5th, said that more attention should be paid to the influence of the mind on the body and of the body on the mind. It was true as Charcot said, *C'est la foi qui sauve, ou qui guérit*, in the case of the functional neuroses. Before the war it was thought that the neuropathic tendency occurred seldom in men, as compared with women, but the formation of a conscript army, in which only physical disabilities were recognized as causes of unfitness, had shown that a large percentage of men were neuropathic and subject to those neuroses, hysteria, and neurasthenia, provided the stress was sufficient to excite their onset. Why was it that physiologists, with few notable exceptions, had ignored psychology? It was because academic psychology was mainly introspective and metaphysical. There was no mind without memory, and no memory without body. All psychic processes were subordinate to physiological processes. All human activities had their primal instincts common to men and animals, namely, self-preservation, preservation of the species, and the instinct of the herd. The psychology of dreams during the war had shown us what an important part they played in disclosing past experiences.

A sign of convalescence in neurasthenia, among the soldiers, was the cessation of terrifying dreams. The wise practitioner, when examining a patient, would remember that the patient was carefully watching every shade of expression on his countenance and although he might feel anxious he should never show it. Sir Frederick Mott having spoken of the herd instinct, and of the great service rendered by those courageous men who thought and acted differently from the herd, added a few words with respect to the neglect of medical psychology. The law required all medical men to diagnose all forms of mental disease. How could this be effected? The question arose whether a short course of lectures on biological psychology should not form a part of a student's teaching in physiology, or whether it should form part of the instruction in mental diseases. That he should be taught it was certain. If he had to teach physiology again he would devote ten or more lectures to the elements of mental physiology.

Book Reviews

BOOKS ON TUBERCULOSIS.

Diagnostik und Therapie der Lungentuberculose. Von HEINRICH GERHARTZ, Professor, Dr. med. et phil. Dritte, verbesserte Auflage. Mit Sixty-seven teils farbigen Abbildungen und Sixteen teils farbigen Tafeln. Berlin and Wien: Urban & Schwarzenberg, 1921. Pp. x-296.

Practical Tuberculosis. A Book for the General Practitioner and Those Interested in Tuberculosis. By HERBERT F. GAMMONS, M. D., Superintendent, Woodlawn Sanatorium, Dallas, Tex.; Assistant Instructor in Clinical Medicine, Baylor Medical College, Dallas, Tex., etc. Introduction by J. B. MCKNIGHT, M. D., Superintendent and Medical Director, Texas State Tuberculosis Sanatorium, Carlsbad, Tex. St. Louis: C. V. Mosby Company, 1921. Pp. 158.

The Clinical Examination of Diseases of the Lungs. By E. M. BROCKBANK, M. D. (Vict.), F. R. C. P., Hon. Physician, Royal Infirmary, Manchester; Lecturer in Clinical Medicine; Dean of Clinical Instruction, University of Manchester; and ALBERT RAMSBOTTOM, M. D. (Vict.), F. R. C. P., Hon. Physician, Royal Infirmary, Manchester; Lecturer in Clinical Medicine, University of Manchester. With Illustrations. New York: Paul B. Hoeber, 1921. Pp. viii-88.

This is the third edition of Gerhartz's *Diagnosis and Therapy of Tuberculosis of the Lung*. The book is well known in Germany and is an up to date treatise on diagnosis and treatment of pulmonary tuberculosis. This edition differs from previous ones in having more perfected illustrations. A very striking illustration is that of thorax phthisicus paralyticus. The other illustrations are very helpful in understanding the topography of the chest and the percussion of the apices. Considerable space is given to the description of diagnosis by x rays and in this chapter particular attention is called to the fact that blood absorbs the x rays to a much greater degree than sputum. The author differentiates cavities due to bronchiectasis by the sputum examination, and says that in such cases the sputum is of a yellowish green color, free from elastic fibres and tubercle bacilli, and the odor is less than that found in gangrene of the lungs. He recommends solar therapy even for pulmonary cases but cautions not to overdo it and to individualize in each case. Glandular tuberculosis he treats with x rays; creosote in its various combinations seems to be the author's favorite medication. Some very good colored illustrations and reproductions of x ray photographs, showing pneumothorax, tumors, and various other pathological processes in the chest are given. Over twenty-five pages are devoted to the enumeration of sanatoria and special hospitals throughout Germany.

* * *

Gammons's book is, as the title says, intended for the general practitioner and it has considerable merit because the author speaks from his personal experience. There has been nothing new in tuberculosis therapy for several years, and so in a textbook of that character we cannot expect anything which has not been said before. Predisposition, diagnosis, treatment, climate, artificial pneumothorax, the use of x rays, prognosis, prophylaxis, and the rôle of general practitioner in tuberculosis are interestingly discussed. The book may well be recommended to

those physicians who have not had an opportunity to study the tuberculosis problem near at hand.

* * *

Never has the reviewer seen so small a book as that by Brockbank and Ramsbottom which contained so much of value as a guide not only for students but even for physicians who have not had much experience in the diagnosis of pulmonary tuberculosis. The first chapter treats of the anatomy and physiology of the thorax and the lungs; the second chapter is devoted to routine examinations, the third to inspection, the fourth to palpation, the fifth to percussion, the sixth to auscultation, the seventh to physical signs of common pulmonary tuberculosis. What is of particular value and quite a novel arrangement is that the differential diagnosis is considered in each of the chapters. Thus, for example, in the same chapter the student can study the subjective symptoms in pulmonary tuberculosis along with those of lobar pneumonia, chronic bronchitis, and asthma. The book cannot be too highly recommended to the student who wishes to get what is most essential to be known in order to diagnose intelligently the diseases of the chest, and particularly pulmonary tuberculosis.

RECENT TUBERCULOSIS LITERATURE.

The last few months have been particularly rich in valuable contributions to our tuberculosis literature, and it may be well to mention some in this number of the *NEW YORK MEDICAL JOURNAL* which is devoted to the diseases of the respiratory organs. To review them all would of course be an impossibility. Outstanding among them is *The American Review of Tuberculosis*, which contained many articles of interest in the July, August and September issues.

* * *

La Revue de la Tuberculose, which appears every few months, is published in Paris. The leading article in Vol. II, No. 3, 1921, is The Importance of Exact Measurement of Intrapleural Pressure in the Treatment of Pulmonary Tuberculosis by Artificial Pneumothorax, by M. G. Kuss. The next article deals with external circumstances and conditions in the contagion of tuberculosis by the bacillus, by E. Arnaud. The third article is entitled *Fréquence de la tuberculose pulmonaire senile*, by A. Courcoux and P. Labesse. The same number contains also an article by Fernand Arloing and Lucien Trevenot on the Action of Rare Salts on the Development and the Morphology of the Human Type of the Tubercle Bacillus in Homogeneous Cultures.

The leading article in Vol. II, No. 4, The Modes of Diffusion of Tuberculosis Throughout the World. The Frequency of Tuberculosis in Civilized People; Its Rarity Among the Savage and Nomadic Tribes, is by the wellknown phthisiologist, Prof. A. Calmette, Associate Director of the Pasteur Institute. A second equally important article, by an equally wellknown authority, Dr. E. Riù, is on pulmonary tuberculosis and pregnancy. The article is

conservative regarding the therapeutic abortion in such cases and the author is inclined to follow the precepts of Pinard who says: "*soigner la tuberculose et surveiller la grossesse*," which freely translated means "to treat the tuberculous and to watch carefully the pregnant condition." He is almost enthusiastic over the value of artificial pneumothorax in women even with advanced tuberculosis when they are pregnant.

* * *

Die Tuberkulose-Bibliothek, which appears in conjunction with the *Zeitschrift für Tuberkulose*, Berlin, offers in its second number of 1921 an article by Max Cohn, entitled *Die Lungentuberkulose im Röntgenbilde*. In the third number there is an article by Ulrici, Grass and Meyer, on the Critical Value of Friedmann's Remedy. Because we had the somewhat questionable honor of Friedmann's visit to our shores some years ago when that gentleman tried to place his marvelous, new and infallible antituberculosis remedy, it may be interesting to the American medical profession to get the latest conclusions on Friedmann's serum. Ulrici and Grass, who worked conjointly in order to determine the value of Friedmann's serum in tuberculosis of the internal organs, came to the following conclusions: "It is not demonstrated that Friedmann's product can immunize any non-tuberculous individual, nor that it can prevent an infection to become active and to spread. In cases of internal tuberculosis one can often observe improvement of the symptoms, such as hyperhidrosis and slight hemoptysis. This improvement as a rule is not lasting. Now and then the process seems to become more localized but accentuation of the symptoms and increased activity of the lesions are far more frequent. The Friedmann cure cannot be applied to ambulant cases; many more clinical experiments with Friedmann's tuberculosis cure and preventive products must be carried on before it can be safely recommended."

In the same number of the *Tuberkulose-Bibliothek*, S. Meyer published experimental and clinical studies of the Friedmann turtle bacilli (*Kaltblüter Tuberkulose Bacillus*). His conclusions are that he cannot attach much value in the immunization of infants vaccinated with Friedmann's vaccine and he agrees with Klopstock that Friedmann's vaccination does not offer a sure nor a lasting protection against tuberculous infection.

* * *

Conférence Internationale contre la Tuberculose was issued by this conference and published by Masson et Cie, Paris. The conference was held in Paris from October 17 to 21, 1920. The volume is most interesting, showing the solidarity of thirty-one nations in the fight against tuberculosis; their delegates being members of the Society of Nations and of the United States of America. Next to France, our country had the largest representation. These were Dr. Gerald B. Webb, president of the National Tuberculosis Association, and Drs. Herman M. Biggs, Haven Emerson, Paul A. Lewis, Edward Lynch, Stephen J. Maher, Charles L. Minor, H. A. Pattison, Linsly Williams, Wyatt of the French Rockefeller Commission, and Col. Henry Alden

Shaw, commissioner of the League of Red Cross Societies in Poland. Dr. H. G. Southerland, of London, and Dr. Bachmann, of Switzerland, gave papers, the former paying particular attention to tuberculin as a diagnostic means and the latter to diagnosis at the different ages of the individual. Then followed an interesting table of the mortality of tuberculosis in the Czecho-Slovak republic which would show that the lowest mortality in 1918 was in that portion known as Slovac where it was fifteen and one tenth in a hundred deaths, and the highest in Silesia of about twenty in one hundred deaths. Sero agglutination of Koch's bacillus compared with other diagnostic means was treated ably by Dr. Paul Courmont, of Lyons. The social question of tuberculosis was also treated by the various representatives. The delegates of other countries gave short reports on the social aspect of tuberculosis in their respective countries. The closing ceremonies of the conference were impressive and interesting. There was a reception at the Hotel de Ville given by the municipality of Paris and another reception given by the Marquise de Ganay, membre du Conseil de direction du Comité national. As the final result of this conference there has been formed an International Union of Tuberculosis with headquarters at Geneva, with the object of fighting tuberculosis in all countries appertaining to this union.

* * *

Lastly, the NEW YORK MEDICAL JOURNAL received for review a pamphlet entitled *Altes und Neues über die Tuberkulose*, coming as a reprint of forty-eight pages from the Coler-von Schjerning Library, Band XLII, by Georg B. Gruber, Prosektor in Mainz, which appeared in Berlin in 1920 by August Hirschwald, publisher. It represents an address read before the conference of the physicians of the Rhineland. The pamphlet gives a summary of previous and modern conceptions of tuberculosis and the fatalistic attitude towards it in olden times. It then speaks of the newly acquired knowledge in tuberculosis and of its clinical divisions. In contrast to the introductory remarks, which were pessimistic because of the sad results of the World War on the social and sanitary condition of the German people, Dr. Gruber's concluding sentence is hopeful. He says: "Today the words tuberculosis and phthisis must no longer have a gruesome and deadly meaning, but must remind us to combat it, for pulmonary tuberculosis can be overcome."

MORRIS'S ANATOMY.

Morris's Human Anatomy. A Complete Systematic Treatise by English and American Authors. Edited by C. M. JACKSON, M.S., M.D., Professor, and Director of the Department of Anatomy, University of Minnesota. Eleven Hundred and Sixty-four Illustrations, Five Hundred and Fifteen Printed in Colors. Sixth Edition, Revised and Largely Rewritten. Philadelphia: P. Blakiston's Son & Co., 1921.

An attempt has been made to simplify the study of anatomy in this sixth edition of Morris's textbook of anatomy by using smaller type for the more detailed anatomical descriptions. This should prove helpful to the student. A new heading has been chosen for what has heretofore been classed morphogenesis; developmental anatomy is the new

and more inclusive title. This has been well handled and the subject is made to include antenatal and post-natal changes. An important chapter on the endocrine glands is most timely, as much work is being done in this field. The spleen, skin and mammary glands, formerly included in the glands of internal secretion, have been assigned to other portions of the book. The spleen is now described under the lymphatic system and the skin and mammary glands are found in a separate chapter.

The changes which have been made in the revision of the subject matter, the typesetting, and the addition and change of plates represent much work, but the results are more than worthy of the effort.

FOLK PSYCHOLOGY.

Elements of Folk Psychology. Outlines of a Psychological History of the Development of Mankind. By WILHELM WUNDT. Authorized Translation by EDWARD LEROY SCHAUB, Ph. D., Professor of Philosophy in Northwestern University. London: George Allen & Unwin, Ltd. New York: The Macmillan Company, 1921. Pp. xxiii-532.

The anthropological school that does not confine its research to individual tribes is ably represented by Wundt. Like Frazer he has seen beyond mere cult phenomena to the psychological strata and excrescences, the groundwork of all human thinking. In his conclusion he speaks of the possible interpretation of his book as a contribution to the philosophy of history. This, he says, ". . . aims, not to acquire a knowledge of reality from *a priori* concepts, but conversely, to derive ideas from reality, in a psychological account of the development of mankind." It is essentially this method that Wundt has followed.

He divides the evolutionary period, the stages of mind development, into three ages, three distinctive culture types giving them their names—the age of primitive man, the totemic age, and the age of heroes and gods. The division is wonderfully pragmatic. Every human being in his growth to manhood parallels this development in a measure.

"Primitive man," Wundt says, "is relatively primitive, for while he does possess certain beginnings of culture, these are in no respect more than mere beginnings, all of which are borrowed from nature and from the direct means of assistance which it offers." He then proceeds to sift out in a masterful fashion the primitive customs, accomplishments, and the vast wealth of belief and myth peculiar to this age. The age of totemism leads us to the tribal organization, the beginning of warfare between members of one clan and another, the growth of cult ceremonies, living carried on in concert; in short, the beginnings of mutual adaptation, and hand in hand with this growth of consciousness of the herd we find the beginnings of exogamy. The age of heroes and gods turns to rulers for the organizing tribes, weaves ritual, and results in the deification of great humans and participation in human affairs by celestial beings. The first age in its psychological attitude towards the surrounding world showed pure phantasy; totems held phantasy and the fact indistinguishably mingled; heroes and gods took actuality and converted it by virtue of phantasy. Modern civilization begins with the acceptance of reality more or less unadorned.

The cultural phenomena that Wundt traces throughout their development are too numerous to dwell upon. Suffice it to say that the growth of the human mind has been depicted in a way beautifully simple to follow and yet fundamentally accurate. The book forms a sound basis for the psychological study of humankind which is more and more engaging the interest of every one.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

WITHIN FOUR WALLS. By EDITH BAULSIR. New York: The Century Company, 1921. Pp. vi-325.

THE TORTOISE. A Novel. By MARY BORDEN. New York: Alfred A. Knopf, 1921. Pp. 280.

WHITE SHOULDERS. By GEORGE KIBBE TURNER. New York: Alfred A. Knopf, 1921. Pp. 283.

IN THE CLAWS OF THE DRAGON. By GEORGE SOULIE DE MORANT. New York: Alfred A. Knopf, 1921. Pp. 297.

SHALLOW SOIL. By KNUT HAMSUN. New York: Alfred A. Knopf, 1921. Pp. x-339.

THE TRIGGER OF CONSCIENCE. By ROBERT ORR CHIPPERFIELD. New York: Robert McBride & Co., 1921. Pp. 313.

MR. WADDINGTON OF WYCK. By MAY SINCLAIR. New York: The Macmillan Company, 1921. Pp. 315.

OPERATIVE SURGERY. By J. SHELTON HORSLEY, M.D. With 613 Original Illustrations. St. Louis: C. V. Mosby Company, 1921. Pp. 721.

SOME MODERN FRENCH WRITERS. A Study in Bergsonism. By G. TURQUET-MILNES. New York: Robert McBride & Co., 1921. Pp. xiii-302.

THE POCKET ANATOMY. By C. H. FAGGE, M.B., M.S., Lond., F.R.C.S. Eighth Edition. New York: William Wood & Co., 1921. Pp. 313.

CHRIST OR BARABBAS. A Psychic Novel. By B. F. AUSTIN, A.M., M.D. Los Angeles, Cal.: Austin Publishing Company, 1921. Pp. 142.

BENIGN STUPORS. A Study of a New Manic Depressive Reaction Type. By AUGUST HOCH, M.D. New York: The Macmillan Company, 1921. Pp. xi-284.

BIOCHEMISTRY. A Study of the Origin, Reactions, and Equilibria of Living Matter. By BENJAMIN MOORE. New York: Longmans, Green & Co. London: Edward Arnold, 1921. Pp. vii-340.

STUDIES IN DREAMS. By MARY ARNOLD-FORSTER (Mrs. H. Q. Arnold-Foster). With a Foreword by MORTON PRINCE, M.D., LL.D. New York: The Macmillan Company, 1921. Pp. xxxv-178.

INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON GENERAL'S OFFICE, UNITED STATES ARMY. Authors and Subjects. Third Series, Vol. II. Arnal-Blondlot. Washington: Government Printing Office, 1920. Pp. 650.

DIE RÖNTGENSTRAHLEN IM KAMPFE GEGEN DIE TUBERKULOSE. Von Dr. MANFRED FRAENKEL, Charlottenburg. Tuberkulose Bibliothek. Beihefte zur Zeitschrift für Tuberkulose herausgegeben von Prof. Dr. LYDIA RABINOWITSCH, Nr. 4. Leipzig: Verlag von Johann Ambrosius Barth, 1921. Pp. 24.

DIE HEILBEDINGUNGEN FÜR DIE TUBERKULOSE IM HOCHGEBIRGSKLIMA. Von Dr. med. BERNHARD KURT VOIGT, Erfurt. Tuberkulose Bibliothek. Beihefte zur Zeitschrift für Tuberkulose herausgegeben von Prof. Dr. LYDIA RABINOWITSCH, Nr. 5. Leipzig: Verlag von Johann Ambrosius Barth, 1921. Pp. 70.

Practical Therapeutics

PRACTICAL POINTS IN THE DIAGNOSIS AND TREATMENT OF SINUS DISEASE.

BY RALPH GETELMAN, M. D.,
Philadelphia.

The subject of sinus disease is one that the general practitioner usually views with a feeling that the condition exists and is the source of many vague symptoms, but for some reason he does not regard it with the degree of seriousness that the condition demands. The definite diagnosis and treatment of the more serious forms of this condition is properly a specialist's field but there are certain signs and symptoms with which every general practitioner should familiarize himself in order that he may detect and promptly institute the proper treatment before the condition reaches the advanced stage.

By the sinuses we mean the cavities found in the bones of the skull communicating with the nose, the mucous membrane of which is continuous. The frontal and maxillary sinus or antrum of Highmore and the anterior ethmoidal sinus open into the middle meatus and the sphenoidal and posterior ethmoidal sinuses communicate with the superior meatus. The symptoms which usually call attention to these conditions are the discharge of pus from the nose with pain of a varying severity, frequently a rise in temperature and symptoms of intracranial pressure. A positive diagnosis, however, should never be entirely dependent upon the clinical symptoms and direct inspection; transillumination and a series of x ray plates are absolutely essential. A well made series of plates will disclose the exact location, size, limitation and anatomical relations of the sinus which is causing the trouble.

DIAGNOSIS OF SINUS DISEASE.

The differential diagnosis on direct inspection may, in a general way, be based upon the source of the pus as noted in the nose. A discharge from the antrum, the frontal sinus, and the anterior ethmoidal cells appears beneath the middle turbinate, the posterior ethmoids and sphenoid and flows into the pharynx from the upper surface of the middle turbinate. The discharge is sometimes seen, however, coming down alongside the septum, between the latter and the middle turbinate. The presence or absence of pus in the antrum is readily ascertained by needle puncture and if, after a careful irrigation, pus again appears beneath the middle turbinate within a comparatively short time, then its source is the frontal sinus or anterior ethmoid cells.

Pressure pain is sometimes an important factor in arriving at a diagnosis. In diseases of the frontal sinus, tenderness elicited by pressure with the tip of the forefinger upon the anterior wall just above the supraorbital ridge, or upon the floor of the sinus at the inner angle of the orbit, indicates some inflammatory condition. Pressure in the canine fossa of a diseased antrum usually causes pain, but in unilateral diseases of any nasal cavity the degree of pressure-

tenderness should be compared with that of the opposite side.

INFECTION OF ANTRUM OF HIGHMORE.

Now to consider more specifically the conditions which may cause trouble in these various sinuses, we find the one most frequently involved is the maxillary sinus or antrum of Highmore. This becomes infected through an extension of an acute inflammatory process in the nose or the extension of an infection of a molar tooth, through the base of the sinus. At the beginning of an attack, there is a sense of fullness and pressure beneath the orbit and pain sometimes agonizing in character, involving the whole side of the face. This, together with a discharge of pus from one nostril, especially if periodical in character with a fetid odor and taste, should at once arouse our suspicion that an infection of the antrum exists, and if upon inspection the pus is found flowing from beneath the middle turbinate our diagnosis is almost positive. In order to confirm this suspicion, transillumination should be used and a dark shadow on the affected side will indicate the presence of pus, or, at least, inflammation. If pus is present the condition is one which demands surgical intervention at once.

The safest, surest and easiest method is to use a curved trocar and cannula. After thorough cocainezation beneath the inferior turbinate and the tip of the septum the point of the needle is introduced beneath the lower border of the inferior turbinate and pressed upward and backward until the middle of the attachment of the turbinate to the nasal wall is reached. In this position is the so-called soft spot, where the wall of the antrum is usually so thin that no more force is required to penetrate it than to push a hypodermic needle through the skin. Air should then be forced through the cannula with a large syringe which will bubble through the contents of the antrum and indicate that the point of the needle is in the proper position. After the needle puncture, treatment consists of irrigation with sterilized warm normal salt solution, using at least a quart daily for a week, then every other day, and finally semiweekly, until cure results.

If a change of treatment should become necessary, depending upon the condition of the secretion, then an antiseptic, such as five per cent. carbolic acid, may be added. However, this is rarely required, as a thorough and careful irrigation with the normal salt solution will result in prompt relief in the majority of cases. If, after thorough lavage of this cavity, pus reappears beneath the middle turbinate within an hour, then we know the primary source of it is either the frontal sinus or the anterior ethmoid cells, and it becomes necessary to consider the conditions which may cause an inflammation of these cavities. Acute catarrh of the frontal sinus is frequently the basis, not only of a local infection but the most important etiological factor in the causation of all sinus diseases.

FRONTAL SINUSITIS.

Frontal sinusitis, however, rarely goes on to supuration, because the ostium affords ample drainage from the most dependent portions of the cavity. The more prominent symptoms are a frontal headache from the beginning of the disease, which is constant, more or less severe, and may spread to the vertex temporal region and even the neck, accompanied by nausea and vomiting. There may be redness and swelling over the sinus and edema of the eyelids. Tenderness on pressure and percussion is always present.

When a transilluminator is beneath the brow, the light is transmitted better by a normal sinus than by one containing pus or a tumor. The size and shape of the frontal sinus varies so greatly in different individuals, however, that a more satisfactory result can be obtained by an x ray photograph than by transillumination.

Upon inspection the typical place for the appearance of the pus is under the middle turbinate. The nasal mucosa is swollen and hyperemic and the nares on the affected side partially or completely occluded. Anosmia on the affected side is due to swelling of the middle turbinate against the septum and usually there is redness and dermatitis of the external nares. The essential factor in the treatment of this condition is that every effort should be made to maintain the ostium in a patulous condition until the inflammation in the frontal sinus subsides. The patient should spray the middle turbinate region of his nose every two hours with a one in ten thousand solution of adrenalin as a home treatment. This, however, is only adequate in the milder catarrhal inflammations. When fluid has accumulated within the sinus it should be removed by a suction apparatus, or lavage instituted by means of a frontal sinus cannula using sterile normal salt solution. Not infrequently a small polypus is found beneath the middle turbinate anteriorly and its removal is frequently followed by a cessation of recurrent attacks of frontal sinus inflammation. After suitable treatment, recovery takes place in at least ninety-five per cent. of acute cases without operation, but where relapses are frequent it is advisable to remove the anterior ethmoid cells. A partial middle turbinectomy first and if this does not succeed, then exenteration of anterior ethmoidals.

If these measures do not prove successful then it is necessary to do a more radical operation. A number of operations have been devised to meet this condition, the most popular at this time probably being the Killian operation, which exposes the frontal sinus by removing a portion of its external wall. This operation has certain dangers, however, which may result in most unfortunate complications, particularly those of an ocular type.

ETHMOIDITIS.

The ethmoid cells are frequently the subject of acute catarrh and supuration, the chronic form of which is usually complicated with polypi. The condition produces a severe pain at the root of the nose increased by pressure at the inner canthus. Upon inspection the middle turbinate and ethmoids are found to be greatly swollen and covered with

pus. Unless this condition is promptly relieved by securing adequate ventilation and good drainage it may go on to thrombosis of the longitudinal or cavernous sinus and meningitis. Acute catarrhal cases frequently recover spontaneously by the use of adrenalin spray at sufficiently frequent intervals, but are best treated by the daily use of the suction apparatus followed by the injection of ten per cent. solution of argyrol.

The constitutional treatment is similar to that for frontal and maxillary sinus disease: Ice bags to the head, eyes and bridge of nose, complete rest in bed, one tenth grain calomel and soda every hour until free purgation is established, assisted by Dover's powder.

When polypi are present it is absolutely essential that they be removed, otherwise the treatment will avail nothing. I believe something ought to be said here respecting operative procedure providing treatment is found futile. For instance, in recurrent cases, patients should be treated until acute symptoms subside or until pus disappears, and then an exenteration of both anterior and posterior ethmoidals done.

SPHENOIDAL SINUS INFECTION.

Infection of the sphenoidal sinus frequently subsides spontaneously but if the purulent discharge continues, then more active measures must be taken. Pain said by the patient to be located in the centre of the head and radiating into the ears is an important symptom and is often due to the pressure of retained secretions. Ocular symptoms of this pressure may vary from the impairment of the field of vision to complete blindness. Because of the proximity with the cavernous sinus to the lateral wall of the sphenoid, thrombosis or a fatal hemorrhage from this vessel may occur. In operating care should be taken not to injure the upper wall because on it lies the optic nerve.

DANGERS OF OPERATION.

These dangers warrant careful treatment of the patient before finally deciding upon an operation. Free drainage by shrinkage of the middle turbinate and septum with cocaine adrenalin solution and washing out the sinus will frequently give almost immediate relief. The greatest objection to most radical operations on the nasal accessory sinuses is the enormous amount of mucous membrane destroyed and replaced by cicatricial tissue. Hence all unnecessary curetting and destruction of the mucous membrane should be avoided, for it should be borne in mind that no matter how greatly swollen and inflamed the mucous membrane of any of the sinuses may be, unless covering necrosed bone, it will finally assume nearly normal functions under favorable circumstances of drainage and ventilation. In some instances the discharge for which the operation was mainly undertaken never entirely ceases. Hence the tendency is towards conservatism, some formerly enthusiastic operators asserting that in the majority of cases better end results are obtainable by treatment, especially treatment by suction rather than by radical operations.

2011 CHESTNUT STREET.

THE REMOVAL OF MIDDLE TURBINATES WITH THE BALLENGER SWIVEL KNIFE.

BY JOSEPH W. MILLER, M. D.,
New York,

From the Ear, Nose, and Throat Clinic, Beth Israel Hospital.

The removal of the middle turbinate for either obstructive enlargement due to overgrowth or disproportionate growth, or for interference with drainage of the adjacent accessory sinuses, brought forth a great variety of instruments for that purpose. Among those most commonly used are Butlin's scissors, Struyken's forceps, Holmes's scissors, all of which sever the attachment of the middle turbinate to the maxilla and the operation is then completed with the wire snare. Other instruments of lesser fame are Andrew's turbinate chisel, Hajeck's hooks, Seiler's nasal scissors, Heyman's scissors, and Jackson's turbinotome. The latter three are more frequently used for operations on the inferior turbinate.

I have not used all of the instruments enumerated above, yet I have had a good opportunity to see different operators use different instruments and watch the procedure of each. In one case there is an excessive narrowness anteriorly; you may find the scissor cut impossible, and the punch forceps must be used to make a more or less vertical cut behind the operculum. This procedure may injure nearby structures, prolong the operation, cause unnecessary hemorrhage and delay healing. In another case you hook around or you imagine you hook around the snare loop on the middle turbinate and drive it home; the result is either a small piece of mucous membrane or nothing at all. Thus the procedure is repeated several times until we finally succeed after having tired out our patient and injured adjacent structures. In a third case, where one uses Andrew's turbinate chisel to remove whole or part of a turbinate, injury to the cribriform plate may occur, due to the fact that the sharp end of the chisel cuts only in a straight direction. Raising the handle of the chisel in order to change the direction of the sharp end is frequently impossible, while lowering it will disengage the chisel from the turbinate. Hajeck's hooks do not always securely engage the posterior end of the middle turbinate when this method of turbinectomy is occasionally tried.

Two years ago, however, I made the acquaintance of another instrument for the purpose of removing middle turbinates. This instrument, which is known to me since I have been in the practice of medicine, and I have used frequently in submucous resections, is the Ballenger swivel knife. To my chief of clinic, Dr. A. Noah Schiller, who first demonstrated middle turbinectomy with the swivel knife in the outpatient department of Beth Israel Hospital, I owe my thanks and appreciation. This method never fails, takes but two to three seconds, is devoid of torture, removes as much as is decided upon in one mass, and leaves no ragged edges.

The procedure, briefly, is as follows: That area is prepared and cocainized as when any other method is used. The swivel knife, somewhat wider than the one commonly used for the removal of the

cartilaginous septum, is engaged at the junction of the middle turbinate and the inner wall of the superior maxilla anteriorly, pushed straight backward for about an inch, and then downward and forward. This will remove the entire middle turbinate. If the operculum only is desired to be removed, one needs to push the swivel knife backward for about a quarter of an inch and then downward and forward. In a word, one may remove as much turbinate as he deems necessary by simply pushing the swivel knife more or less backward.

Of course, it must be pointed out that one should never recklessly push the swivel knife upward and backward lest one injure the cribriform plate and create serious intracranial complications. Otherwise the swivel knife is the instrument of choice, as the operator absolutely controls the movements and direction of the knife.

This method has given me great satisfaction, as it saves time, shortens the agony of the patient, does not injure adjacent structures, is neat and clean, and hence encourages rapid and early healing.

After the middle turbinate is shaved off from its attachment, it is found on the floor of the respective nasal chamber posteriorly and can readily be seized and removed with any intranasal grasping forceps.

Numerous turbinectomies, taken both from private practice and from the otorhinolaryngological department of the Beth Israel Hospital, service Dr. Joseph Weinstein, have been performed with this method by me. There were no complications whatsoever in any of the cases. The usual reaction with the consequent congestion of the nasal mucosa giving rise to intranasal obstruction in the respective nasal chamber does not last longer than three to four days. So rapid is this method that whenever both middle turbinates were condemned for removal, double turbinectomy was undertaken at one and the same sitting, with little disturbance to the patient. That this procedure is a godsend to the rhinological surgeon goes without saying.

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Surgical Treatment of Empyema by a Closed Method.—Arvine E. Mozingo (*American Journal of the Medical Sciences*, May, 1921) asserts that early operation by the closed method has the following advantage: It can be done, regardless of the stage of pneumonia or condition of the patient, without shock or lung collapse; it completely evacuates the cavity, relieves cardiac and respiratory embarrassment, and prevents the absorption of toxins; it lessens the usual thickening of the pleura. The general advantages of the procedure are economy of time, labor and dressing material; minimum pain and discomfort; in uncomplicated cases the patients are not kept in bed; less likely to have recurrence, or the condition become chronic, or need a secondary operation; maximum expansion of the lung; small scar and no chest deformity; practical in the home and in country practice; mortality lower. A cure can be effected in acute bilateral empyema, both sides being operated on at the same time, with acute bilateral pneumonia present, when treatment by the open method is impossible.

Intravenous Injection of Calcium Chloride in the Treatment of Diarrhea and Vomiting in Tuberculosis.—Rist, Ameuille, and Ravina (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, July 7, 1921) found intravenous injections of one or two grams of calcium chloride practically innocuous, such injections causing merely, in some instances, a sharp pain along the course of the vein, metallic taste in the mouth, and a feeling of warmth within the head, at times accompanied by flushing of the face, all passing off in about thirty seconds. Even the most debilitated consumptives tolerated the rapid injection of two grams of the salt without reaction. The solution generally used was of fifty per cent. strength; weaker solutions are too bulky and cause no less local irritation if there is leakage during injection. With the doses mentioned, diarrhea and vomiting are completely and permanently arrested in fifty per cent. of the cases and relieved partially or temporarily in forty per cent. more. Where the first injection of one gram is not completely successful, a second injection of two grams may be given with advantage. All forms of diarrhea are benefitted, whether unattended with organic bowel lesions or associated with amyloid degeneration or tuberculous ulceration of the ileum or colon. Only persons experienced in intravenous work should administer these injections, for if leakage occurs during injection, a slough forms and at least two months are required for the wound to heal.

Medical Treatment of Quinsy.—G. Railliet (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, April 28, 1921) reports good results from the intravenous injection of colloidal silver in the form of collargol or electrargol, a procedure originally recommended to him by Triboulet. From experience in sixteen cases he concludes that this treatment always causes more or less marked reduction of the pain and frequently brings about complete recovery and removes the necessity for incision. Pain was sometimes allayed within an hour, though oftener in the course of the day. In three cases the measure, carried out in good time, failed to arrest the process of suppuration, but there was at least a temporary reduction of the pain. The solution of collargol used contained 0.25 gram to 1,000 mils, and the dose administered was five mils. Triboulet advised the use of collargol as freshly prepared as possible, but this was not always feasible in general practice. It may be useful to repeat the injection on two successive days after the first administration. The proper time to inject is as soon as the diagnosis of quinsy is unmistakable, that is, generally between the second and the fourth days. In one instance, an injection on the fifth day proved successful. Alvarez has reported nine cases in which good results followed repeated intramuscular injections of ten mils of electrargol, while Netter has stated that it may be sufficient to rub in colloidal silver thoroughly for fifteen minutes after cleansing the skin with soap and water and alcohol, using a brush, such a procedure bringing complete and abrupt relief at the end of four to six hours. The author used this method in a child, in whom recovery followed in a few days, and in one adult, whose recovery was influenced by other treatment.

Asthma in Childhood.—Charles E. Sundell (*Clinical Journal*, May 25, 1921) considers treatment under three headings:

1. As pointed out by Guthrie the asthmatic storm brews before it breaks: a period of fretfulness, malaise or indolence lasting for two or three days may culminate in an attack. Recognition of this in the case of a child who is known to be asthmatic may avert the paroxysm by enforcing rest and protection from excitement.

2. During the attack symptomatic treatment becomes necessary. The distress of the patient and his relatives is so great that general measures alone can no longer suffice. An intramuscular injection of three minims of one in a thousand adrenalin solution may cut short the paroxysm; if, as is common in children, much bronchitis is also present, one two hundredth grain of atropine may be added to this. These doses can be repeated if necessary in half an hour. Morphine may be called for: it is safe to give a child of five years who is otherwise healthy one twelfth grain. In infants nothing gives more relief than a few whiffs of chloroform, but in older children its use calls for great caution. Cases of moderate severity may yield to an emetic or a hot bath, but unless these measures are successful quickly they should not be persisted in. Fume inhalations have two serious disadvantages: children as a rule dislike them, and there is evidence to show that their use leads to the asthma habit. When the attack subsides the child usually falls asleep; if nervous excitement persists and delays sleep it is well to give a dose of chloral (ten grains to a child of five years).

3. Treatment between the attacks affords us the best means of overcoming the disease unhampered by the presence of urgent and distressing symptoms. The indications are general rather than special, but they are of supreme importance and call for patient and continuous supervision. These children are very prone to be coddled, for the anxiety of the parents to protect the child from chill almost always shows itself by the maintenance of a scrupulous but thoroughly unsound régime: the patient wears too many clothes, rarely goes out without a muffler, is not allowed to breathe night air, and is often confined for days at a time to stuffy and stagnant indoor atmosphere. The doctor has an uphill task, but he will not succeed till he has transferred the mother's allegiance from flannel to fresh air. In view of the child's nervous instability it is necessary to cut off as far as possible exhausting and disturbing influences. School pressure, late hours, exciting parties are to be forbidden; gastric indiscretions are to be controlled, with a special reference to the avoidance of constipation and flatulence. Arsenic is our most valuable drug; it seems to act best in an acid mixture, and it can be given with advantage in small doses over a long period. It may be necessary as a temporary measure to give bromides, but as soon as the child has acquired a regular sleep habit they should be replaced by strychnine. It is important to remember clearly, and if possible to convince the relatives of the patient, that asthma is not a chest disease any more than measles is a skin disease, and that the best line of treatment is one that ignores the lung and builds up a healthy nervous system.

Proceedings of Societies

AMERICAN CLIMATOLOGICAL AND CLINICAL ASSOCIATION.

Thirty-seventh Annual Meeting, Held in Philadelphia, June 15, 16, and 17, 1921.

The President, Dr. LAWRASON BROWN, of Saranac Lake, N. Y., in the Chair.

President's Address.—Dr. LAWRASON BROWN, of Saranac Lake, said that the success of a medical society depended upon whether its founders and directors possessed vision. Its first and foremost function was to bring together medical workers. Free intercourse among medical workers, he believed to be essential to the development of an investigator's highest qualities. Its members being interested in more or less similar lines of work, it should function along the lines of group study of patients. He laid stress on the value of discussion, and thought it might be a good thing to have informal meetings where the younger men could ask questions of the more experienced. He expressed the opinion that fitness alone rendered a man's observations of value, by fitness meaning honesty, carefulness, and willingness to abide by one's observations, no matter how many cherished theories they might overthrow. He believed that personal experience should be based upon carefully studied statistics of personal observation, and not upon personal impressions, which often covered a lack of recorded observation, and availed only for diagnosis.

Postural Rest for Pulmonary Tuberculosis.—This paper, by Dr. GERALD B. WEBB, Dr. ALEXIUS M. FOSTER and Dr. G. BURTON GILBERT, of Colorado Springs, was read by Dr. WEBB. It stated that rest had been proved to be of value in tuberculosis of the joints and of the larynx, and defined artificial pneumothorax as a method of applying rest to the lung affected with that disease. Physicians had never fully applied the principle of rest to the tuberculous lung. The majority of patients with pulmonary tuberculosis were likely to lie on the side of the lung that had little infection, the actively diseased lung being thereby allowed the greater movement. The authors described their method of applying practical rest to the lung by having the patient lie on the affected side, the results of this treatment, they asserted, having been excellent.

Tuberculosis and Influenza.—Dr. JOHN B. HAWES, 2d, of Boston, from his experience during the influenza epidemic and that of others, drew the following conclusions with especial regard to tuberculosis:

1. Eternal vigilance was the price of safety. One should regard any patient who came down with a cold or other acute symptom, whether he had tuberculosis or not, and whether he dwelt in or outside of a sanatorium, as a possible subject of influenza, and, at all events, a source of contagion.

2. Although he thought it quite probable that the tuberculous patient possessed a certain degree of

immunity to influenza, one should not take this for granted, and should make every effort to prevent his contracting that disease.

3. He stated that the treatment of influenza was the same in a tuberculous as in a nontuberculous person. It should be based on rational lines of rest, elimination and stimulation, if necessary. It should be regarded as a serious but by no means hopeless or fatal complication.

4. He considered postinfluenzal bronchitis and debility real and definite clinical entities, but thought that in many cases they served to disguise a newly awakened pulmonary tuberculosis. In every case in which either a cough or prolonged physical depression followed influenza, the patient should be kept under careful and constant supervision.

5. The early diagnosis of pulmonary tuberculosis, he maintained, had been made increasingly difficult on account of influenza and its effects. While he admitted that many cases of tuberculosis had been discovered or made active on account of influenza, he was convinced that there were numerous patients who had been wrongly classed as consumptives, owing to signs and symptoms, constitutional and referred to the lungs, that were really due to influenza and not to tuberculosis. He thought that care, conservation and common sense were needed more than ever before in handling this difficult problem.

Dr. CHARLES L. MINOR, of Asheville, N. C., said he was sorry that Dr. Hawes, in his questionnaire, had not asked, first, whether influenza awakened a sleeping but unrecognized tuberculosis; second, whether the tuberculous patient was unduly susceptible to influenza; third, did influenza, occurring in a tuberculous patient, increase the rapidity of the process? He had no doubt that the patients coming to Asheville, some sent by physicians and some coming of their own accord, who had shown no symptoms of tuberculosis, were in the influenza epidemic of 1914-15, which suggested to him that influenza woke up a latent tuberculosis. That must be verified by sputum examinations, because post-influenzal conditions indicated tuberculosis. He had noticed no special immunity. He was not able, however, to draw conclusions as to the effect of influenza on tuberculosis.

Odds and Ends in Tuberculosis.—Dr. CHARLES O. PROBST, Columbus, Ohio, considered this subject under four heads: tuberculin, temperature, work and rest, and mental influence. While he supposed he would be considered old fashioned in advocating the use of tuberculin in the treatment of tuberculosis, he decided to mention a case in which an improvement in tuberculous eye trouble took place after the discontinuance of local treatment and the administration of tuberculin. In regard to fever, he said that he did not feel sure that the normal temperature of the patient was always at the arrow mark on thermometers. He had had a patient who seemed in good health, in whom the temperature was at no time over 98° F., and another who always

had a temperature of 99° F. He advocated the taking of the records every two hours for four days or more. He considered it possible that nervous patients who had been impressed with the importance of slight variations in temperature might give themselves psychical rises when they used the thermometer. Complete rest he did not consider necessary for slight elevations of temperature, if there were no other symptoms, believing that rest in tuberculosis was often overdone. In many cases, he stated, complete arrest of the disease had been accomplished without having the patient stop work. Consciously or unconsciously, he believed, all good physicians make use of psychotherapy, but few do so intelligently. He had heard the president, Dr. Brown, say that he thought that tuberculin would do good if he had more faith in it. Dr. Probst said that this meant if he could inspire the patients with more faith in it. He considered the cure of the patients, by any means whatever, as the life work of the physician. Apropos of tuberculin, he mentioned another case, in which massive doses were given to a man with a tuberculide of the buttock as large as the hand, with involvement of the larynx. The ulceration had resisted local treatment for two years; but in ten months' time, with tuberculin and local treatment, it entirely healed, and had remained so for six or seven years.

Occupation of the Active and Arrested Cases of Tuberculosis.—Dr. BAYARD T. CRANE, of Rutland, Mass., divided his paper into four sections, as follows: a, occupational therapy for active cases; b, choice of occupation for arrested cases; c, an industrial colony for chronic fibroid cases; and, d, economic considerations. In considering the first of these, he said that sanatorium treatment would have more professional and lay friends if it were humanized, and if an effort were made to make the life there more pleasant to the patient. Occupation would be of value in this direction, and might also be to a certain extent curative. The term psychotherapy by occupation would better define the object of such a system, intended to alleviate the abnormal nervous states of the patients, such as restlessness and introspection. He selected the amount of work each patient was capable of performing, leaving to the instructor and the patient to choose the kind of work. He had found this system curative when other things had failed in about five per cent., and extremely valuable in fifty per cent. An attempt should be made to make these activities gainful to the extent of defraying the cost of the patient's maintenance. The economic problem of the occupation of the tuberculous being one of the largest with which humanity has to deal, the physician must participate in the solution of it, because the physical limitations of these patients are so subtle that the lay mind does not comprehend where safety stops and danger begins. He should be able to define the class of cases which, while still positive, can safely, within limitations, pursue partial or entire self-support. He may not, however, have great knowledge of industrial conditions, and so be unable to advise the patient where to find employment that will not overtax his strength, and will yet return a sufficient income to provide adequate nourishment

and comfort. If the man could not fit the occupation, the occupation must be made to fit the man. An industrial colony should be the next great step in the fight against tuberculosis, and Dr. Crane said that such a colony was being planned in Rutland.

Dr. FRANK A. CRAIG, of Philadelphia, said that there was no phase of the subject of tuberculosis that was so important and interesting as that brought up by Dr. Crane. As far as the arrested case was concerned, an attempt was made at the Phipps Institute, when it was first started, and was carried on for a few years, to provide occupation for such cases; and since then, at White Haven, there had been established a training camp for nurses. A certain number of women were thus placed in a position to earn their living and retain their health. The women had been pretty well looked after, as far as the training school was concerned; but there was great need of some occupation for the male patients. It was a question what to do with the patients who returned. An attempt was made at one time to run a shirtwaist factory, where the patients were allowed to work for a number of hours a day, according to their strength. While successful from the viewpoint of the health of the patients, it was not successful financially.

Dr. E. O. OTIS, of Boston, said that in Boston occupational therapy had been undertaken, and the enterprise had been very successful. Most of the patients were in the advanced stage of tuberculosis, and many welcomed anything that gave them something to do. Curiously enough, the Anglo-Saxons and the Irish were the ones that cared the least about it; the Italians and Russian Jews were more anxious. Weaving, rubber working, bead work and that sort of thing were done, and the patients were paid for their work. There was no difficulty in marketing the kind of baskets they made. The question was to find something that could be readily made by these patients that was readily saleable, so that they might have the encouragement of receiving certain, definite pay for the work they did. It was a great source of relief from the monotony of the life there to many patients.

Lymphocytosis as a Diagnostic Sign of Focal Infection.—Dr. JUDSON DALAND, of Philadelphia, stated that relative lymphocytosis occurred in fifty-four per cent. of one hundred cases of focal infection with systemic manifestations, but that in only one per cent. was the lymphocytosis absolute. Small lymphocytes were increased in thirty-one per cent., while large lymphocytes were increased in only eleven per cent. and decreased in eighty-six per cent. Leucopenia occurred in fifty-six per cent., and leucocytosis in only nine per cent. Therefore the first factor of importance diagnostically would be the increased number of small lymphocytes, and the second, the association with leucopenia. With these two factors joined, the value of the findings would be very great. Dr. Daland was of the opinion that if these figures were accepted, it would be safe to state that they constituted what might be called a leucocytic picture, having a certain diagnostic value. By means of it one could recognize the value of a focus of infection and certain systemic conditions. One could not be sure that the systemic conditions

were in distinct association with the focal infection, and must often be undecided whether one should do anything radical regarding the focus of infection. When, however, a lymphocytosis was found in the blood, with a leucopenia associated, he felt satisfied in recommending radical steps concerning the focus of infection. In a few cases he had been able to assure himself that all foci had been removed, and by making leucocytic counts at weekly intervals and at intervals of two weeks for as long as two months, he had seen the picture in these cases restored to normal.

The Treatment of Tuberculosis of the Larynx.—DR. ALEXIUS M. FOSTER, of Colorado Springs, devoted the principal part of his paper to a discussion of a laryngeal mirror that he had devised for reflecting the rays of the sun upon the diseased part of the larynx. This mirror was made of an alloy of aluminum and magnesium, which reflected eighty-five per cent of the actinic rays and absorbed most of the heat rays. The treatment could be given by the patient himself. The exposure was not longer than thirty seconds at first, and the length of time was gradually worked up to ten minutes. Thirteen cases were reported by the author, who felt that this solar laryngoscope, if properly supervised and supplemented by all the other accepted forms of treatment, constituted a valuable aid in the treatment of laryngeal tuberculosis.

Studies in Vibrations Causing Pulmonary Physical Signs.—DR. CHARLES M. MONTGOMERY, of Philadelphia, stated that the physical signs investigated were normal and abnormal vocal fremitus and resonance, whispering pectoriloquy, and bronchial breathing, special attention being given to the following: 1, The difference in characteristics between the spoken voice and the normal pulmonary vocal resonance; 2, the phenomena of, a, the presence of normal vocal fremitus and resonance in the absence of whispering pectoriloquy and bronchial breathing found over normal lung, and, b, diminished vocal fremitus and resonance in association with whispering pectoriloquy and bronchial breathing found in certain pathological conditions.

Intravenous Injections of Calcium Chloride in Pulmonary Tuberculosis.—CHARLES L. MINOR, of Asheville, N. C., stated that their own limited experience and that of others had convinced them that in calcium chloride they had a remedy that could frequently palliate and relieve, and that when they could diagnose their cases early it might even prove curative. While the results that they presented were not brilliant, and while they were based on but a small number of cases, their significance was such as to encourage the authors to a further use of the drug. They felt that they had prolonged the lives of some of their patients and had made others more comfortable by the use of this method of treatment. Consequently they believed that a fair trial should be given it by those who saw enough of such cases to enable them to draw conclusions as to its value. At the same time, they hoped that the reason for its good effect might be worked out in the pharmaceutical laboratories. A table was given showing the results of their cases.

Progressive Changes in the Aorta and Lung in Tuberculosis and Syphilis.—This paper, by DR. CLEVELAND FLOYD, DR. HORACE K. BOUTWELL and DR. R. L. LEONARD, of Boston, was read by DR. FLOYD. From this study it seemed to these authors that every patient having tuberculosis with syphilis should receive intensive syphilitic treatment, especially if the lesion was not typically one of tuberculosis. The presence of syphilis, they thought, might at times considerably aid in the production of fibrous tissue in the lung. Syphilitic dilatation of the aortic arch, even in well marked instances, might be improved by prolonged and intensive treatment. Some of the radiograms that Dr. Floyd exhibited showed very little evidence of pulmonary syphilis. The first plate, however, showed very definite signs of changes in the aorta. The arch was much dilated before treatment.

A Study of Destruction and Repair in Pulmonary Tuberculosis.—DR. BERTRAM H. WATERS, of Loomis, N. Y., considered briefly the occurrence of either marked improvement or otherwise in a patient, often without the slightest apparent change in the environment or routine. He discussed this in rather a speculative way, and illustrated the accompanying pulmonary condition by means of stereograms. He insisted upon the value of the latter in frequently enabling one to forecast what are usually termed relapses, and suggested the importance of a study of the underlying biochemical factors that must precede these "relapses."

Tubercle of the Lung.—DR. J. B. ELLIOTT, of Toronto, Canada, reported a case of moderately advanced tubercle of the lung, for which an artificial pneumothorax was made, resulting in apparent cure. The man appeared so well, indeed, that he was taken into the military service and served in France, performing all the laborious duties incident to the life of a soldier. Finally he received a gunshot wound in the chest, and underwent several operations. He was afterwards referred to Dr. Elliott, who made a study of the case in order to see what further could be done. It was then discovered that he had had an artificial pneumothorax performed earlier. The case resulted in chronic empyema.

Diagnosis of Myxedema.—DR. JAMES M. ANDERS, of Philadelphia, presented a communication on this subject, in which he said that myxedema was insidious in its course, rendering an early diagnosis difficult, and emphasized the importance of recognizing this disease, in view of the fact that a sovereign remedy for it existed. Unrecognized and long overlooked cases with serious physical and mental developments would, he said, fail to respond in a satisfactory manner to appropriate measures. Statistical evidence would show that the condition was often overlooked. In the majority of cases, some of the more characteristic features would be wanting. The author described incomplete types that might touch certain other diseases of endocrine origin, and briefly considered the relation of myxedema to exophthalmic goitre. He believed efforts to stimulate interest in the subject to be both timely and important.

(To be concluded.)

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Miscellany.

Symptomatology and Diagnosis of Foreign Bodies in the Air and Food Passages.—Chevalier Jackson (*American Journal of the Medical Sciences*, May, 1921) presents a summary of the chief points in the symptomatology of these cases.

Larynx.—Foreign bodies cause an initial laryngeal spasm, followed by wheezing, croupy cough, and a variable degree of impairment of phonation. Pain may be present and is sometimes referred to the ears. The larynx may tolerate a thin, flat foreign body for a long time, but dyspnea renders early removal imperative in most cases.

Trachea.—Foreign bodies are usually movable, their movements can be felt by the patient, and the vibrations may be palpated and heard with the stethoscope. Cough is usually present, may disappear and recur, and may be violent. Sudden shutting off of the expiratory blast and phonation during the cough is almost pathognomonic. Dyspnea is usually present. The asthmatic wheeze is usually present, is often louder and of lower pitch than that of bronchial foreign bodies, and is heard at the mouth, not at the chest wall. Pain is not common, but may occur.

Bronchi.—Early symptoms are initial laryngeal spasm; diffuse purulent laryngotracheobronchitis within twenty-four hours in children under two years of age; fever, toxemia, cyanosis, dyspnea, and paroxysmal cough, with inability to cough up the thick pus through the swollen larynx. Lung abscess forms rapidly. The older the child the less severe the reaction. There is acute obstructive emphysema, shown by limited expansion, muffled tympanic percussion note, diminished or absent breast sounds on the obstructed side, many râles and harsh breathing on the free side. The radiograph shows greater

transparency on the obstructed side, displacement of the heart toward the free side, depression and limitation of the diaphragmatic movement on the obstructed side. Late symptoms are cough and purulent expectoration; periodical attacks of fever, with chills and sweats, followed by increased coughing and the expulsion of much purulent material; emaciation, clubbing of the fingers and toes, night sweats, hemoptysis, all the symptoms of tuberculosis simulated, but without bacilli. Pain may localize the foreign body. Metallic or organic foreign bodies may cause a peculiar taste in the sputum. Sudden complete obstruction of one main bronchus does not cause dyspnea if its fellow is functioning, but is followed by rapid onset of symptoms. The physical signs usually show limitation of expansion on the affected side, impairment of percussion, and lessened transmission or absence of breast sounds distal to the foreign body. The pleura is rarely involved. The asthmatic wheeze may be present. A radiographic study should be made.

Esophagus.—There are no absolutely diagnostic symptoms of esophageal foreign body. Dysphagia is the most constant complaint. Pain may be present. The subjective sensation of foreign body is usually present but cannot be relied upon. All these symptoms may be present when the foreign body is absent. The fluoroscope and röntgenograph should be relied upon.

Vaccination Against Tuberculosis.—Karl Von Ruck and Roswell E. Fläck (*Medical Record*, June 18, 1921) consider that every child should be vaccinated against tuberculosis, and the earlier it is done the better the chances that no infection with tuberculosis has already occurred. Points emphasized are: 1. Tuberculous infections can be prevented only by vaccination. 2. The certain diagnosis of the presence of the tubercle bacillus in the organism can be made only by resorting to biological tests. 3. Tuberculous lesions still accessible to the circulation can be made to disappear by the use of specific vaccines. 4. The rapidity and uniformity of the results depend upon the time elapsed since the infection has occurred, the extent which the lesions have reached, and the degenerative alterations which are present in them.

Bacteriology of Chronic Nontuberculous Lung Disease.—Horace Greeley and Mae Brereton (*Journal of Laboratory and Clinical Medicine*, April, 1921) studied the sputum in thirty-one cases of lung diseases which was persistently negative for tubercle bacilli. The examinations were made by smear and culture, planting a 0.3 per cent. lactic acid nutrient agar with smears of the sputum, incubating tubes from each case at both body and summer temperatures. Such higher fungi as the *Penicillium glaucum* group were found in fourteen cases; the *Mucor corymbifer* in two cases, and *Aspergillus fumigatus* in one instance. As a result of this investigation the authors conclude that such organisms are extremely numerous in sputa, and that they are probably potent in the disease process, acting alone in some cases, and in others in cooperation with the tubercle bacilli.

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WHOLE No. 2223.

The Man Galen and His Times

By JONATHAN WRIGHT, M. D.,

Pleasantville, N. Y.

In the first section (1) of this account of the times of Galen, some allusion was made to the possible effect of Christianity upon him. At least the environment in which our faith took root has, I think, left its impress on his works.

It was at Smyrna in the time of the early Christian martyrdoms that he received a part of his education, both philosophical and medical. There he studied with Pelops and with Albinos the Platonist and with the Stoic Philopator (2) having also studied at Pergamus under Gaius (3) or some pupil of his until, as the result of his father's dream, he deserted metaphysics and turned his attention to medicine. Beside these instructors of his youth he fell under the influence there of Stratoniceus, a disciple of the Hippocratic Sabinus (4) and of some follower of Aspasius, the peripatetic (5). Among his early instructors it is Pelops to whom he most frequently refers, who was a disciple of Numesianus (6), and to Quintus (7). In the house of Pelops he resided for a time, but Metwald (8) seems to think his medical education was almost entirely due to Quintus, the pupil of Marinus, but Galen also speaks of being much taken with the instruction of Heraclianus at Alexandria (9). However, his acquaintance with previous medical literature as well as with that of his own time was too wide for him to be influenced exclusively by any one authority, living or dead, excepting Hippocrates whom he rarely contradicts. Wellmann (10) declares it is not so much Quintus as Rufus, the dogmatic of Alexandria, whom Galen follows. In reading Galen I have not got that impression, though if any one ever deserved the name of dogmatist it is Galen. He himself studied with Numesianus at Corinth (11). All these are names only for us but they serve to show the width of his preparation and the earnestness with which he entered upon his career. Of his student life at Corinth or at Smyrna or at Alexandria we have no details. From his account of his régime at home and at Rome we may well imagine it was that of an earnest and ardent student. It was in 151, just after his father's death, that he studied at Smyrna, but even before this he had written something on the anatomy of the uterus and the diseases of the eye and an exercise on the empirics, a sum-

mary apparently of a dispute between his teachers, Pelops and Phillipos. His assiduity never flagged and his health suffered from his labors until later he learned to regulate his regimen. It was his boast in later years that even in his youth he learned to correct his conduct and regulate his passions also (12), which, for a boy not out of his teens and handicapped in having for his father a man of wealth, even though a man of wisdom, was something to boast of. Marcus Aurelius was not so successful in the education of Commodus. It is interesting to observe the efficiency and the failures of the ancient stoicism in this training of youth. As usual the good and the evil the gods alone bestow peep through it all. We take note of his unctuousness in congratulating himself that he is not as other men in after life. This superiority he attributes to his nurture rather than to his nature, but his characteristics are quite in contrast to the nobility and the humility of the meditations of Marcus Aurelius. He seems quite as vain of his mental equipment as of his moral.

How much time he spent in Alexandria in contact with what was once all the world had to teach in anatomy and physiology is not at all known, though his seeking knowledge elsewhere also is in itself significant of the fact that the preeminent scientific activities at Alexandria had long since passed with the best of the Ptolemies. Ptolemy Physkon (171-167 B. C.), because of family quarrels, had once driven scholars and physicians out of Alexandria and through this, as has happened before and since in the course of history, as much as through the gradual invasion of knowledge, the arts and sciences were scattered throughout all Hellas, according to Athenæus, and in the time of Strabo (66 B. C.) there arose a second school of Herophilean anatomy in Asia Minor (13). We infer he was at home when his father died. Despite the latter being something of a dietitian we learn that his death followed the injudicious eating of some fruit, and Galen himself at the time twenty-one years old was sick in the same way (14). He had evidently long since begun the study of his profession and was perhaps even then engaged in its practice. He was subsequently a student in Alexandria (15) and when he returned

home he had to learn the properties of medicaments peculiar to his own territory (16). It seems that his period of preparatory study was a long one away from home, but it is not certain where he was for the longest part of the ten years he seems to have devoted to it, though as a matter of fact he never ceased from being a student engaged in research in his art. Although the reference to Alexandria and the Alexandrian anatomy and its authors are frequent and there seems no doubt of his residence and perhaps of more than one visit there, it does not appear how long his stay was or how much, if any, his experience with human dissection was. It is doubtful if he ever did more with the human subject than study its bony structure (17), but evidently his other researches there were extensive. When he returned to his own country he was twenty-eight years old and we infer he had been long absent. Intending to devote himself to surgery he was intrusted a year later by the pontifex of the gladiators at Pergamum with the supervision of their health, their illnesses and their wounds (18). It was the duty of the pontifices to procure and organize them into a company. Rich men like Atticus, the friend of Cicero (19), sometimes bought gladiators, slaves for the most part at that time, and hired them out for the games. By the time of Galen it was quite a business in the world. Gladiators were transferred from place to place, from company to company, like baseball players or actors under contract. In Pergamum the shows were given in the summer and Galen had to treat their wounds, so his experience was largely surgical when he went to Rome.

We get a pretty good idea (20) of the subsequent course of his life until he was over sixty, but there is some confusion and some gaps in it which seem impossible to overcome. He speaks (21) as though he were a practitioner of Pergamum and Rome but a stranger neither to Alexandria or Athens. In his thirty-fourth year he first went to Rome, where he remained three or four years, apparently, and if he returned from Alexandria when he was twenty-eight, he must have practised five or six years in Pergamum. We do not learn why he left the provinces for the capital. All roads then led to Rome. There he acquired much reputation and made many enemies. He longed, because of the latter misfortune, he gives us to understand, to return to his old home. He does not definitely say how long his first stay in Rome extended. A certain coyness falls over his pages (22) when he speaks of leaving it the first time. His first stay at Rome was about four years and Ilberg (23) reckons that from 164 to 168 A. D. On account of the plague and for other reasons he went back to Pergamum, but returned to Rome in 169, eluding Marcus Aurelius's invitation to serve in the army. As to this first rather precipitous retreat from the city, disgust, he says, with the life at Rome, with the envy of himself by his fellowmen and a disinclination for the honors he tells us he won, are the ostensible reasons, but a suspicion of something else shines through what he says. He seems to have been dodging conscription into the army, or perhaps only dodging the plague as Kühn says in his preface.

He writes a description of how much he was

sought after by the mighty. Knowing they had it in mind to draft him, he begged them to delay his appointment to official duties in the army thinking it would interfere with his plans for returning home. As soon as the war was over in Bithynia he left the city by stealth and went to Brundisium, whence he could take ship for Dyrrachium and thus escape from the soldiers they might send after him. It does not appear whether the soldiers caught him or not, though presumably he got away safely for the time, but the arm of Rome reached everywhere. The only escape from it was death. Lucius the brother and colleague in the empire with Marcus Aurelius, called upon him to accompany the army in its campaigns against the Germans on the Danube, but in 169, Galen being close on forty, Lucius died. Nevertheless, following that or subsequently or perhaps on more than one campaign he served in the field with Marcus Aurelius. At one time Galen fled from the armies in the train of his master to escape the plague in Aquileia (24). The first time he served with him at any rate, the emperor's antidote mixer dying (25), for from these accounts it seems Marcus Aurelius contemned death chiefly in his *Meditations*, Galen was appointed to the office in immediate attendance on his majesty. We infer that before this he was only one of the army doctors, unwillingly dragged into the service, but was known by reputation to men in high command. He evidently acquired much credit with the emperor and he prevailed on him to free him from army duties, so distasteful to him, and even to provide a place for him of honor and emolument, where he would be less annoyed by jealous competitors in the profession.

Since he found Rome so hostile to his genius he was appointed to medical attendance upon the boy Commodus and permitted to dwell near him in the country outside of Rome, perhaps until Marcus Aurelius died in 180 B. C., where he found ample time and leisure for literary work (26). This admission to imperial favor he apparently owed to an official by the name of Boethus, who introduced him to Septimius Severus, not the one afterwards emperor, but said to have been a son in law of Marcus Aurelius. It is impossible definitely to establish the chronology of the different periods of his activity in Rome. There were three of them at least. Reckoning from various figures, some of them already alluded to, and comparing them both with the incidents he tells us of his own life and with known dates in history, he could hardly have been in Rome more than four or five years the first time, probably less. It is astonishing he should in that time have formed such important connections in high life at court, though he may have had time to make enemies in his profession. When he returned from the army and acted as physician to the young Commodus, after being in medical attendance on the emperor, doubtless all doors were open to him at Rome and by that time he was as much hated for his worldly success as before for his disagreeable personality. The second time he says he stayed three years, perhaps going into the city under the protection of the court when the emperor returned. He forsook Rome the second time and this time in order again to escape from

the plague (?). This he relates with no sign that such conduct for a doctor in his day was considered disgraceful. It does not appear how long he remained away, probably not long, and when he returned Marcus Aurelius was still reigning. The latter dying in 180 he was in favor still with Commodus and was alive and probably, as we have seen, physician to Septimius Severus (27), who reigned from 193 to 211. The extent of his writings in themselves indicate he lived a very long life. Even if he died in the last year of Severus's reign he must have been eighty and there is no reason to suppose he died at an earlier period, but there is no proof positive beyond the book to Piso, that he lived even in the reign of Severus, beginning in 193 A. D.

Kühn, however, is disposed to think that he lived at least until thirty years after the death of Lucius Verus in 169 A. D., because it was at that time apparently he mixed the antidote for Marcus Aurelius. In the treatise on antidotes (28) he seems to say that Severus, nearly thirty years after he had prepared the medicine for the great emperor, requested that he should mix a similar one for him. If he did this for Marcus Aurelius at a later date than that of his first attendance upon him, though the inference does not support this, his age at the time of writing the book is correspondingly lengthened. Many legends, having their origin apparently in the Middle Ages, prolong his life beyond that for which there is any indication in his writings. If he referred (*l. c. p. 5*) to the making of the ointment at the end of Marcus's reign and not to the antidote, that would lengthen his life at least until 210. He may indeed have lived that long but in all probability he is referring to the incident when he especially mentions making an antidote at his first attendance, shortly after the death of Lucius Verus. On this evidence we may say he lived at least until he was seventy or thereabouts and of course he may have lived long after he wrote *On the Antidotes*.

During his student days and perhaps at other times we find him in the cranky vessels of the period ploughing the waters which wash the shores and flow around the islands of the eastern Mediterranean in search of vegetable and metallic drugs, thus to be sure he had the best that enterprise and energy could procure, without trusting the representations of the dishonest dealers who thronged the drug markets. Among other things he carried home with him was copper powder from the furnaces of Cyprus. Even before he went to Rome at all it would seem that his experience with the world had by that time been sufficient to have made him careful to enter more diplomatically upon the new field. The pet of wealth and fashion at Pergamum evidently found an unexpectedly hostile reception at Rome. His acquaintance with the high society of Bithynia, his familiarity with the stage door of the gladiatorial arena, one would have thought, might have tempted him before he went thither to ways of riotous living. We find him referring to these diversions which have so often wrecked the most promising career when entering upon a more cosmopolitan field of activity, in a way that shows at least worldly wisdom of another kind.

"Some of those who seemed to me to love me personally often complain that since I have become more addicted to earnest study of the truth I have become of no use to them or to myself. Leaving off my great ardor in its pursuit, I should go around mornings greeting people and in the evening dine with the mighty. To be respected for studious accomplishments, to become skilful in them, even to acquire gratitude by them is of no help in the profession, for it is not from these that those judge who spend all the day in different pursuits. Those succeed who are occupied indeed in the morning with greetings but who afterwards divert themselves in the forum, at the trials in crowds, with the mountebanks, and with the still larger crowds at the chariot races, with dicing, whoring, bathing, drinking, eating, or wallowing in other pleasures innumerable. In the evenings they are collected together at the clubs, where after they have filled themselves with wine, the harp or zither or other musical instrument goes the rounds. It used to be the good custom to be acquainted with these; indeed not to know how to play them was disgraceful, but there is no talk of a worthy kind such as the ancients used to practise and enjoy in the olden time at the clubs nor any other decent thing, but they are earnest in excelling in the size of their potations, so that among them not he is thought best, who is skilful on several musical instruments or is practised in philosophical discourse, but he who has emptied the most and the largest cups. Next morning they seem still drunk and some smell so of wine one would think they did nothing else. Ruined in health they call in, not the best physicians at all, but those who have been the companions of their revels" (29). This highly moral young man, on the contrary, so moved the gratitude of patients when he first came to Rome they thought his voice that of the golden Apollo, speaking from his tripod (30), he said.

He expresses a surprise we do not feel, that even his more properly behaved new acquaintances in the profession soon came to lie in wait for him to trip him up. They were an ignorant lot, he said. "Rumors filled the city that just as I had surpassed older men in much else, so I had now written much on anatomy, which was in no way proved. I laughed at them and held them in contempt" (31). He declares some report cases they have never seen, even in their dreams (32), and one might as well prophesy to an ass as talk to some of these men. It was doubtless difficult to hide such sentiments as these, which we can gather still more abundantly if we seek their exposition in the various books, written at different times, but entertained constantly as part of the nature of the man. They could hardly have made him popular, to say the least, when they came to listen to him at the Temple of Peace, "the most distinguished physicians taking the first seats and beginning to question me without loss of time" (33). That he overcame such serious handicaps and carried all before him, which we have, however, from him only, is a testimony to his talent. He devoted himself to practise and followed the city customs of his profession. He says (34) in speaking of an ointment, recommended by the surgeon, Megeus Sidonius, that if he were in Asia he would try to get some

experience with it, but in Rome the treatment of ulcers was left to the surgeons. The oculists he also found jealous, so he preferred for prudential reasons to write privately about diseases affecting the eyes or anything which is properly surgical. It was only, therefore, in the uncontrollable impulses of his nature that his worldly prudence forsook him.

Not only because we get a glimpse of him in the streets of Rome but because he tells us something we are likely to forget about the history of surgery, it is worth while to note what he says about the ligature of arteries, too often thought of as a much later acquisition in the art (35). This was done when bleeding was practised from the arteries of the temples. We see him on his way down the Via Sacra in search of the proper kind of material for it.

"There are some ligatures for this purpose, not readily becoming putrescent, such as at Rome are called Gajetanian (Cadiz?), brought from Gaul, and especially in the Via Sacra, which leads from the temple to the square. But if you are practising in any other city, those which are called silken should be bought, though large quantities of the others can be bought at Rome very cheaply. Those that decay easily, such as are found in country places, quickly fall away from the vessels. In Rome and also in other places under the rule of Rome, rich women make use of these silken cords" (36).

His provincial rawness and perhaps the crassness of his behaviour and the imprudence of his tongue to some extent wore off in his new environment. At any rate he did win friends and his talents attracted attention in high places. His triumph in prognosis in the case of Eudemus, not the poisoner of course in the time of Tiberius who was the lover of Livia, but evidently much later a professional brother high in the esteem of his fellow practitioners, marked him as a man of talent and learning. Eudemus, like Asclepiades before him, was evidently a fellow countryman of Galen and probably had known his father. We get here a hint how the wily and voluble Greeks from the Asiatic provinces flocked to Rome under the empire and made their way there. Perhaps he had some reason for thinking that the dislike of the chief physicians, when he first came to Rome and thus triumphed, was due to envy and he swore as soon as his native land was no longer the seat of war he would go back to it. The things he says Eudemus told him about his new colleagues were the worst possible. He got into trouble with the stoics and with the peripatetics too, beside the troubles he says the brilliancy of his professional attainments made for him. Eudemus became his warm friend and admirer and so did Glaucon, the philosopher (37), who Ilberg thinks afterward became his assistant being much impressed by a wonderful diagnosis Galen had made, due to his slyness and his quick apprehension more than to his medical knowledge. To the latter, on his own statement (38), were due the cures which his astonished fellow practitioners came to know of, especially perhaps that of a noble Roman lady. We appreciate how helpful to the young practitioner such a lucky case is. He was a veritable sleuth hound at smelling out evidence. Per-

haps it was Boethus's wife who was the noble lady he cured. It was Boethus's boy at any rate, Cyrillum, who deceived his mother so artfully but whose surreptitious enjoyment of jam (?) was revealed to the matchless inquisitory powers of Galen. The passage (39) is a very amusing one, full of humor in itself and abounding in Galen's vaunts, who apparently does not appreciate the humor at all. There is another story in the same vein, which copies the pulse story, so often attributed to Hippocrates but to several other physicians as well besides being found in Herodotus and Lucan attributed to still others. A lady was in love with Pylades, the dancer, and Galen found out her secret from her pulse (40). Again elsewhere he tells another tale, one of malingering, in which he outwitted a slave (41) faking a sore knee in the face of a long journey afoot.

I have alluded to his medical charge of Commodus when that young hopeful was being educated by Pitholaos. Galen tells a story of his care of the boy while he was suffering from a sore throat (42). The empress, Faustina, a lady blindly and fondly loved by the great Cæsar, the best and wisest of men, taking Galen by the hand in the presence of rival doctors, green with envy doubtless, told them he had overcome them not in words only but in practise. "Here are more enemies for me," said the poor man to himself after he had accompanied her to her chariot. He also tells of a night call he had to the emperor himself, probably at a later period and he recounts with glee his victory over his professional enemies, "than which nothing more admirable ever happened to me" (43). He assured this mighty monarch and revered philosopher that he was not in for a fit of sickness, but had eaten something which disagreed with him, a thing sedentary philosophers, Celsus thinks, were very likely to do, and perhaps emperors too. The other medical attendants had gravely shaken their heads, but the emperor said he was the only one physician for him. If this is not the acme of professional glory I do not know what is.

If there were any he especially singled out for enmity among the sects of medical practitioners at Rome it was the Erasistrateans, albeit he seems to have been an Ishmaelite, with his hand against every one and every one's against him. He attacked them most bitterly on the score of venesection, but even that a man long ago dead should enjoy such honor as Galen found for Erasistratus at Rome seemed to excite the gall of the aspirant to new laurels. Galen has him much on his mind. We find Celsus entertaining much respect for his memory. Even Galen has occasionally to pay tribute to his anatomical observations and the power of his intellect, but he wrote books against him and his followers on phlebotomy (44), which Erasistratus had earnestly condemned on theoretical grounds and Galen as vivaciously commends. In his opinion he smote them root and branch. It must be confessed blood flowed in torrents from the veins of the patients of the Sangrados for more than one thousand five hundred years until statistics or the slowly penetrating satire of the author of *Gil Blas* brought Erasistratus to his own again in practice.

It is difficult to quote from Galen's works pas-

sages relating to his personality without exhibiting his overweening and aggressive vanity. It is all pervading and irritating even to the reader today. In Cicero the grace of his style and the respectability if not the originality of his philosophical ideas, his broad humanity and his wide sympathy with the opinions of others, his catholicity of thought, things utterly foreign to Galen, make us forget he too was permeated by a self-esteem which makes him at times ludicrous to posterity as it made him disliked by those few of his contemporaries not enamored with his intellectual gifts; but it is otherwise with Galen. It is the keen perception of the problems of his profession and the indefatigable labor with which he attacks them, resulting apparently in some original contribution to the then existing knowledge of the anatomy and physiology of man, form for us the redeeming traits in the personal character of Galen, but it is very uncertain how much he received from his instructors and how much was due to his own research. We can scarcely doubt the latter was considerable, we can hardly believe it is as much as he would like us to infer. We know he pursued research with an adumbration of modern experimental methods of no mean order, especially in investigating the functions of the motor nerves. The animation of the same spirit carried him, we have seen, on distant and dangerous voyages. He sought not only the drugs and herbs well known to the medical science of the day but he investigated the myths of the poets and the scarcely more reliable tales of contemporary merchants and travelers. *Moly*, with which the fair Helen stimulated the young Telemachus in the *Odyssey*, he does not make out, if the name is a guide, to be of the character Homer gives it at all. It is a certain black root in the woods of Syria and Cappadocia with a milky flower "weakly warming, dissolving the humors and increasing the urine" (45).

In attempting to run down the story of some Lemnian earth having been mixed with goat's blood and thereby possessing magic or at least medicinal properties, he incidentally refers to a visit, among other places, to Cyprus to examine its metal (46) to Syria, "a part of Palestine" to inspect the bitumen and other things, to a pedestrian tour to Thrace and Macedonia and a futile attempt to find Lemnia in the Alexandrian Troad and finally to another more successful voyage, when he found at its origin the peculiar red Lemnian clay suitable also for making seals. There was always mystery and magic interest in seals and the kings and priests employed them in that part of their business habitually of old; now but a trace of it remains. Near the "phæstiada," whereby we are reminded of Phæstum in Crete and of its famous clay seals, but in the distant island of Lemnos, he located this much lauded earth "to the east and the west of Myrina," which had found its way to the drug markets at the seaports which were the gateways of Rome. His opinion of the Lemnian clay differed on the side of the rational from that of his brethren, but it was made up also of fables of his own as to its medicinal qualities, scarcely less wonderful to us than the tales which had excited his curiosity; for Galen too dabbled, moderately it is true, but much more extensively

than Hippocrates, in magic; only that he did not accept it unquestioningly is to his credit. Some one told Galen that by muttering an incantation one could kill a scorpion by spitting on it, but he knew this was wrong because he had killed a scorpion by spitting on it without an incantation. "I traveled in Lemnos, Cyprus and Syrian Palestine to increase my knowledge of drugs." He could not trust the dealers. Only the aloe one saw taken from the packs of the camels could one be sure were not adulterated (46a). He treasured in his house an excipient for salves and plasters his father had prepared in Bithynia when he was a boy.

Queer stories he heard on some of his travels, some matching, perhaps originating, the like tales in our day. One was of a man having eaten heartily of pork at an inn and finding a human finger among the bones. Fearing lest he also should be made up into pork, if the hosts became aware of his discovery, he fled, after vomiting, but he subsequently heard the inn keepers were arrested for slaughtering the human animal—the "long pig" Stevenson reports it is called in the South Seas. He repeats much that he had heard in various places and something of what he said he had himself verified as to matters which impugn either his understanding or his veracity or both, as in the scorpion story for instance and others (47).

Much has been said as to Galen never having dissected the human body. As I have intimated I doubt very much if this is strictly so. He says those physicians, who had opportunities in the German wars of dissecting the bodies of barbarians, contributed nothing to the knowledge of anatomy more than the cooks know (48). As he was for a time with the emperors on one or more of their campaigns against the Germans, he doubtless was at least familiar with the fact and may have practised it, but evidently his methods of anatomical investigations were for the most part limited to animals. Although his opportunities may have been limited and it was for this reason he depreciated dissection of the human body, elsewhere he speaks of the opportunity occasionally arising to dissect the abandoned dead bodies of robbers, so that he must have seen it done and perhaps practised it himself, though rarely.

It may have been because of his wide extended travels and numerous acquaintance throughout the Roman world, but at Rome too he had prospered greatly and there as elsewhere he had become a famous man. We wonder from this account he gives of himself that no more than a single secular mention is made of him in contemporary literature, for he would have us know his fame reached to the uttermost corners of the known world. "I received letters from Iberia and Celtica, from Asia and from Thrace, in which I was begged to send medicine to the writers," and he asserts he cured many people by this "distant treatment." This he related in a book he wrote on eye troubles (49), which he wrote for private circulation perhaps or possibly after he became so firmly established in favor that he dared to face the displeasure of the specialists at Rome.

There are so many passages bearing on the character of Galen that one wonders all the more that the rich mine of hints of the medical atmosphere at

Rome in his time has not been more assiduously worked out in the study of what he has left us, formidable as it is. There is scarcely another individual in antiquity who has left us such a coloring of life, all but two thousand years ago, unless it is Cicero in his correspondence. The latter writes with a matchless grace, which of course we poor grubbers in the fields of science have no reason to look for in the musty works of one of our brethren. He disarms criticism, but Galen no more disarms the criticism of the modern reader, when he writes of his own performances, than that of his contemporaries in his converse with them. One wonders, not so much that no one mentions him, except as a "muleshead," as that no one murdered him. In the exposition of the art of ancient medicine, however, he has written with astounding industry and, on the whole, with clarity if not elegance of style. At any rate no history of medicine is complete which does not deal thoroughly with what lies between the covers of his innumerable books and it will always be so.

In regard to his books (50) he says that Greek boys, in their education, were taught from the beginning to know the authorship of the books from the context and they did not have to depend on the title. Think in our day of a halfback or a short-stop with that sort of an education. He saw a bookseller throw aside a book as spurious in Sandalarium, a little place near Rome, labelled with his own name. So indifferent was he in this matter of titles that he had given to friends books he had written without title or name and they dying the books had passed into the hands of strangers at home and abroad who were delighted with them—others had themselves written his name on them. Some were written hastily. He tells us he dictated some of the books on phlebotomy hurriedly to a boy amanuensis as he was on the eve of departure for Ionia. Many were uncorrected. Some to which his name had been added were not his books at all and to some of the genuine books wrong titles had been given by others. When he went back home he found the three books he had written for Pelops. When he returned to Rome he found much confusion from this sort of thing. At this time he collected and put in permanent shape what he had taken from his teachers and what he had done for himself. With all this source of error it is remarkable that there are so few of the books collected under his name and remaining to us about which the reader has any doubt. Once acquainted with Galen and his style, whether one is a Greek boy or not, there is no mistaking him. Many of his books were stored in the Temple of Peace and when this was destroyed by fire some, of which there were no other copies, were burned (51). The emperor was indulgent to him and he wrote a second time his *Utility of the Parts* and his *Commentaries on Hippocrates and Plato*, two of his most important books. Taking him as he was personally and with what he has left behind him he is a unique figure. There is not his like in professional or lay literature and though there is almost no contemporary account of him, he has conferred on posterity a priceless legacy and he has won for himself a deathless fame.

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26. *On His On Books* (xix, p. 19).
27. This depends on the doubtful authenticity of the book *On the Theriac to Piso* (xiv, 214 seq.). See Kühn's remarks in his preface.
28. *On Antidotes*, Liber I, cap. XIII (xiv, 65).
29. *On the Methods of Treatment*, Liber I, cap. I (x, p. 2).
30. *On the Humors*, Liber III, cap. I (xvi, p. 457).
31. *On His On Books* (xix, p. 21).
32. *On Places Affected*, Liber IV, Cap. VII (viii, 261). See also v. 8.
33. *On His On Books* (xix, p. 21).
34. *On the Methods of Treatment*, Liber VI, cap. VI (x, p. 454).
35. In *Celsus* (v. 26. 21) too we find the ligature of bloodvessels plainly indicated.
36. *On the Methods of Treatment*, Liber XIII, cap. XIII (x, p. 942).
37. *On Places Affected*, Liber V, cap. VIII (viii, 361).
38. *Concerning the Functions of Purgative Medicines*, cap. IV (xi, 340 seq.).
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40. *Ibid.*, p. 631.
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42. *On Prognosis to Posthumus*, cap. XII (xiv, 661).
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51. *On Antidotes.* Liber i, cap. xiii (xiv, 66).

A Consideration of Obscure Mastoiditis*

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The anatomical situation of the mastoid process, in view of its communication with the middle ear and nasopharynx via the Eustachian tube, subjects it to the influences, good or evil, of the latter. By keeping in mind the fact that the mucous membrane covering the nasopharynx extends up through the Eustachian tube, and acts as the mucosal lining of the tympanic cavity; then, being still further modified, forms the internal layer of the membrana tympani, covers the ossicles, and finally extends up through the aditus into the mastoid antrum and cells, where it also serves as the mucoperiosteal covering, we can readily appreciate the facility with which pathological conditions of the nose and throat can, by continuity of structure, involve the tube, middle ear and mastoid.

As numerous as diseases of the middle ear and mastoid are, they would be much more frequent were it not that the physiological action of the ciliated epithelium of the Eustachian tube has a tendency to inhibit microbic invasion and the inflammatory reaction incident thereto. This, then, brings us to a realization of two important facts; the first is that practically all mastoid disease is secondary to middle ear inflammation or suppuration, and this, in turn, is secondary to the primary nasopharyngeal disease. The second important point, and one which we should constantly keep in mind, is that in every case of acute tympanic suppuration, the mucous lining of the mastoid antrum and cells is also involved to a greater or less degree. So long as the aditus remains patulous and the opening in the drumhead ample, free drainage is provided, the symptoms rapidly subside, and recovery quickly follows in the average case. You all are more or less familiar with this type of patient, and some no doubt have felt a sense of security born of the fact that nothing but this mild form of mastoiditis has fallen to your lot.

On the other hand, when drainage is obstructed or the infection is virulent, the swollen mucous membrane becomes macerated, due to pressure from accumulated secretion, and peels off, exposing the underlying osseous structure to the ravages of the microorganisms. Thus is ushered in the first stage of intracranial complications. However, it is not this fulminating type of mastoiditis nor the mild form outlined above that I wish especially to discuss.

It does not require much skill to diagnose a case of mastoiditis that has been neglected sufficiently long for a carious erosion through the cortex to take place, with the resultant accumulation of pus between the periosteum and bone, causing a tumefaction behind the auricle and pushing it far forward, and yet it frequently happens that this late symptom makes its appearance before a definite diagnosis of mastoiditis is made.

In an abscess of either the middle ear or the mastoid the accumulating pus must find an exit and

will usually follow the line of least resistance, which would be a spontaneous rupture of the membrana tympani in the former or a carious erosion through the cortex, as above indicated, in the latter. In infants the pus may force its way through the squamo-mastoid suture without destruction of bone, or it may make its exit along the posterior margin of the external auditory meatus, between the periosteum and bone, to the outer surface of the mastoid, and this may happen without perforation of the tympanic membrane. This wise provision of Nature usually establishes the direction of the inflammation and erosion as external, not internal, for when the reverse is encountered we enter upon a trail that leads to the development of meningitis, brain abscess or sinus thrombosis.

Before directly discussing the subject of obscure mastoiditis, I cannot refrain from emphasizing the importance of the familiar saying that an ounce of prevention is worth a pound of cure, which can be best illustrated by citing a type of case which is frequently seen by aurists. A child suffers from an acute suppurative otitis media complicating some local or general infection, frequently without the ear being suspected. If the aural involvement has not been recognized sufficiently early, a spontaneous rupture of the membrana tympani occurs, resulting in a subsidence of the marked symptoms for the time being. Soon thereafter the same condition in the other ear is recognized early and relieved by a prompt evacuation of the fluid from the tympanic cavity by means of a free incision of the membrana tympani. The second ear makes a prompt and complete recovery. The one having the spontaneous rupture shows mastoid involvement requiring operation.

I have gone into this somewhat in detail, and just as it actually happens very frequently in the practice of all aurists, so that I may impress upon you the importance of incising a membrana tympani early and freely in all middle ear abscesses, and furthermore, to point out the advisability of examining the ear frequently in all the acute infectious diseases and other general illnesses, with a view that this measure may be applied and mastoid and other complications thereby prevented. If pain and fever continue after free drainage has been established, some complication must be anticipated, the more common being mastoiditis, even in the absence of other symptoms.

Even this preventive measure, early resorted to, will not, of course, prevent mastoid and other complications in all cases, for, as stated above, if drainage through the aditus becomes obstructed by swelling of the mucosal lining, operative mastoiditis is very likely to develop. However, early evacuation of pus from the middle ear cavity will not only prevent most complications, but will insure, with some subsequent treatment, a return to normal hearing in most instances.

*Read before the Medical Society of Northampton County, Pa., June 17, 1921.

It is to be assumed that we would all recognize mastoiditis when the classical symptoms of redness, swelling and tenderness back of the ear are shown in the presence of a suppurative otitis media, and yet these manifestations are very late signs and should not be waited for, any more than we would wait for the presence of a clot in the jugular vein before recognizing the existence of a lateral sinus thrombosis or the symptoms of peritonitis before diagnosing appendicitis. When we find a profuse discharge from the external auditory canal persisting, suppurative mastoiditis is almost assuredly present, as it is quite impossible for such a quantity of exudate to be secreted in the small tympanic cavity. This one symptom is indicative of suppurative mastoiditis even in the absence of other important symptoms, such as pain and a rise of temperature.

In children the cortex is usually thin and is readily perforated by carious erosion, causing relatively early tenderness and swelling over the process. Where the cortex is thick, however, the probabilities are that pain or perforation would occur very late, if at all; the inflammatory process, under such circumstances, would follow the line of least resistance and in all probability would be directed inward.

Drooping of the superior posterior osseous wall is an unfailing sign of mastoiditis that almost assuredly requires operation for its relief. This symptom is the result of an otitis of the bony wall separating the external auditory canal from the mastoid antrum and the swelling of the soft parts lining the same. Should it happen that the disease is confined to the tip, you would not have this drooping of the osseous wall, but the condition might require operative intervention just as urgently.

A slight rise in temperature, perhaps not more than 99° , is characteristic of mastoiditis, but if the discharge is not in any way obstructed it may not be above normal at any time, or may even be subnormal in the morning, as I have seen occur in the case of two children during the past week. It is not uncommon in children for the temperature to go as high as 105° or 106° during the very early stages. An infant suffering from ear disease will toss its head from side to side and show a tendency to put its hand up toward the affected ear. These are symptoms which should be remembered.

A good rule to follow and one that will often clear up a doubtful diagnosis is to examine the ears of a child in all cases where a diagnosis has not been definitely made or cannot be surely determined. I see many cases of this type. Frequently the child, even though old enough to talk, does not complain of pain in the ear or show other aural symptoms. One week ago I operated on a child three and a half years of age who presented symptoms which, on casual observation, would no doubt be termed atypical, but which in reality were quite typical of mastoiditis. Twelve days previously the child complained of a mild earache, followed by spontaneous rupture after two days of more or less discomfort, with discharge for another two days, the boy pursuing his usual activities meanwhile. Three days later severer aural pain necessitated the calling of a physician, who incised the membrana tympani, evacuating a moderate amount of fluid. Discharge continued for a

short time, then suddenly stopped, the parents feeling that the boy had recovered from his otitis media. A few days later, however, a swelling appeared over the temporal region and in front of the ear. The tumefaction had increased to a marked degree when I saw the patient shortly afterwards. It is interesting to note that there was not any swelling, redness or tenderness over the mastoid process so far as could be determined. An x ray examination showed the cells to be necrotic and well filled with pus, more particularly the tip. There was not the slightest drooping of the superior posterior wall of the external auditory canal. At operation the x ray findings were confirmed. The pus had burrowed its way through the cortex at the extreme upper part of the antrum, and finding an outlet here, while the aditus was more or less swollen, the discharge ceased by way of the external auditory canal, followed the line of least resistance between the periosteum and bone, and was deposited up through the temporal region and down in the neighborhood of the parotid gland, a large drainage tube full of greenish yellow pus being evacuated. This case may seem atypical from the fact that the discharge suddenly ceased from the external auditory canal and swelling occurred above and in front of the ear, the mastoid apparently being normal, and yet a sudden cessation of active middle ear disease is always one of the most important indications that the mastoid has become involved.

The second case was similar in character to the first; a child four and a half years old, upon whom I operated recently. Two weeks previously he had suffered from an acute otitis media, with spontaneous rupture and an immediate profuse discharge, which continued for several days without additional symptoms, the temperature being as low as 97° in the morning. On the eighth day the discharge suddenly ceased, and a swelling appeared above and around the parotid gland, the mastoid and temporal region being apparently normal. There was no bulging of the superior posterior wall. This swelling continued for two days and became very marked, even to the extent of partially closing the eye. Up to this time the parents had treated the child without medical advice, but at this stage their family physician was called and he, in turn, asked me to see the patient, who was promptly operated upon and about the same conditions found as were related in the former case. From the fact that there was no carious erosion through the cortex in this case, it is altogether likely that the pus found its way through the fissures of Santorini to the parotid gland and surrounding tissues.

Another type of mastoiditis which may be regarded as atypical is that in which the pus accumulating in the lower part of the mastoid again follows what seems to be the line of least resistance, burrows through the tip and is deposited in the tissues of the neck, causing a tumefaction below the mastoid, known as Bezold's variety of mastoiditis. Here again we may have a sudden cessation of discharge, or, in case the latter continues, the symptoms will be greatly ameliorated for the time being, when the pent up pus in the mastoid process finds its exit in the neck.

Still another variety of mastoiditis which may be obscure is that in which, notwithstanding that there is an ample discharge from the external auditory canal, the osseous structure of the tegmen antri and tegmen tympani undergoes necrotic changes, slowly or rapidly, through being exposed to the ravages of microorganisms, thus ushering in the initial stage of a meningitis or brain abscess. The same process takes place when the erosion destroys the thin plate of bone separating the sigmoid sinus from the mastoid cavity, causing either a perisinus abscess or a sinus thrombosis. I have seen cases of meningitis develop very rapidly, resulting in death in an incredibly short time. On the other hand, the development may be very slow, the patient going about his usual pursuits at times until the disease is well advanced and recovery almost hopeless. The same is likewise true of sigmoid sinus involvement. Our efforts, therefore, must be directed toward a prompt recognition of tympanic disease and the relief of the same by free incision of the membrana tympani. Should the mastoid become seriously involved, it is much better to drain early through operative interference than to run the chance of an intracranial complication by delay.

As an aid in diagnosis the blood count is of great importance. A high leucocytosis indicates the patient's resistance to the disease. A high polymorphonuclear percentage represents the severity of the infection. It is evident, therefore, that if these maintain the same ratio toward each other, the protection of the leucocytosis is sufficient to counteract the destructive action of the polymorphonuclear element.

If, on the other hand, the leucocytosis decreases and the polymorphonuclear percentage increases, the progress of the disease must be viewed with some gravity. Should the leucocytosis remain high and the polymorphonuclear percentage decrease, we can record a favorable change. This indicates not only the diagnosis but the prognostic value of frequent blood examinations.

Röntgenography has proved a valuable aid in obscure cases, when the interpretation is given by an expert. The mechanical art of actually taking an x ray photograph is perhaps not difficult to acquire, but the interpretation demands technic of a high order which can only be perfected by long study and extensive clinical experience, together with a proper knowledge of anatomy, pathology and the shadow values of x ray plates. The position of the sinus can almost invariably be located and this alone is of the greatest assistance to the operator.

From the time of Hippocrates, although I do not think that he was guilty of the procedure, it has been the custom to apply blisters and poultices to the mastoid in cases of mastoid disease, and although this practice has been largely abandoned, it still exists to an extent in this day of "personally conducted" treatment by the laity, and I am taking this occasion of calling your attention to this practice, with the view that you will warn your patients against following it, as it never does any good and frequently, I believe, converts a simple hyperemic mastoiditis into a suppurative one; furthermore, it will often mask localizing symptoms.

1429 SPRUCE STREET.

Surgical Endothermy in Accessible Malignancy*

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It is now generally accepted that in the fight against malignancy there are four powerful weapons: surgery, radium, the x ray, and endothermy, each especially effective in a particular group of cases. Of the four, taking thought of the great range of malignant forms, surgery undoubtedly remains the chief hope. Radium has its marvels of relief and cure, as has the x ray, but there are many cases of accessible cancer which yield more readily to endothermy than to any other curative agent.

It is possible to make clear the two processes of endothermy, desiccation and coagulation, by means of very simple illustrations. If one holds a cake of soap in his left hand and with his right passes a flood of sparks over and into any one spot with the needlepoint applicator from the Oudin resonator of a high frequency machine, the result will be immediate dehydration or desiccation, the soap—in almost powdered form—rising around the needle, to be scraped off easily. With a properly adjustable

machine the current can be throttled down to such an extent that only the superficial or uppermost portion will be desiccated, or it may be advanced so as to penetrate to any depth desired. If a sheet of paper be interposed between soap and needle, the desiccation may be performed as described above, the current passing through the paper without burning or even charring it. When employed by the physician in treating a patient a similar result is obtained, a result first described by Dr. W. L. Clark, of Philadelphia, as desiccation. Its distinguishing characteristic is the production of heat in the tissues from within, and both in action and effect it differs radically from heat applied from without, as in fulguration and cauterizing.

Now, if one places on the passive electrode (the plate) a piece of liver, he can, with the active electrode (the needle) of the d'Arsonval current, describe a circle of coagulation necrosis as he will. Then by inserting the needle within the tissue inside this circle he can coagulate or cook the whole area *in situ*. This coagulated part can be removed with a pair of scissors without hemorrhage or exudation

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of fluids. This briefly describes the procedure in removing an accessible malignant area of large proportions.

The use of both coagulation and desiccation is



FIG. 1.—Prickle cell carcinoma on back of left hand involving index and middle fingers. Unfortunately the picture does not show elevation of growth, which was an inch and a quarter to an inch and a half above the surface.

illustrated in the following report of a case of squamous cell carcinoma of the hand:

CASE.—W. L., aged fifty-eight, a native of Dublin, Ireland, when a boy of eleven, dropped on his left hand, near the base of the thumb, two or three drops of hot tar. The result was a severe burn which in time became ulcerated and spread until it was as large as a twenty-five cent piece. For more than two and a half years this persisted despite the use of various ointments. Then its character changed and it became a mass of small seedlike growths. These small growths spread across the hand to the little finger, and on the upper arm appeared deepseated boils which resisted many months of treatment, finally clearing up to leave deep scars. Again, when the patient was twenty-two years old, the entire arm became inflamed on all surfaces, only



FIG. 3.—Front view of hand shown in Fig. 1, healed after treatment with endothermy.

the palm of the hand being relatively free of the eruption. Finally, the ring finger became so enlarged it was necessary to amputate it.

In all this time there were varying diagnoses: Erysipelas, elephantiasis, tuberculosis, warts, and syphilis. About four years ago a small wart appeared on the index finger and grew rapidly. In September, 1920, a diagnosis of epithelioma was made, and x ray treatment was instituted. In April, 1921, after an enforced absence of some weeks from the city, the patient came under my care at the Vanderbilt Clinic. Fig. 1 shows the condition of the hand at this time. The Wassermann reaction was negative. The lesion then measured about three and a half inches in length by two inches in width, with an elevation of one and a quarter to one and a half inches. It was decided to employ surgical endothermy before resorting to the extremity of amputation.

With the patient under ether narcosis the malignant area was isolated from the surrounding tissue by means of the high frequency current. Lymphatics and bloodvessels were thus sealed off and the chance of metastasis and danger of recurrence were thereby greatly diminished. The malignancy was then attacked by the electric current and coagulated *in*



FIG. 2.—Section taken from lesion in Fig. 1, showing squamous cell epithelioma with pearl formation.

situ, after which it was cut out and the area curetted down to a healthy base. This was then seared over to control all bleeding and secure a further penetration. The next day the patient was free from pain and reported that for the first time in many weeks he had slept the night through. On the second day he left the hospital, there being no aftercare in this case except that during the course of the healing an occasional small nodule appeared and was immediately desiccated.

This case is typical of that great class of accessible malignancy for which no treatment is so efficacious as surgical endothermy. The treatment is rapidly given and is easy. Because the bloodvessels are sealed off before the growth is excised there is practically no hemorrhage and almost no surgical shock. That severe pain which tortures sufferers from cancer ceases immediately when the malignancy is

removed and the patient's postoperative condition is generally most satisfactory. The wound heals quickly, usually with only a slight scar. It is, of course, not always necessary to anesthetize the patient. The destruction of less extensive growths is done under local anesthesia.

In a recent article (1) I described the details of treatment by surgical endothermy which the reader may find of interest. Time was when the value of x rays in cancer was scoffed at by many medical men, and even today we not infrequently hear practitioners of standing protesting that radium is useless in such cases. So it is probably not to be wondered at

that numbers of men remain to be convinced of the importance of the fourth great soldier in the fight—endothermy. Fortunately the evidence of its superior value is piling up, and in the near future neither cancer hospital nor cancer specialists will feel fully equipped for the work unless prepared to use, in indicated cases, desiccation and coagulation.

I wish to thank Dr. George C. Andrews for taking the clinical photographs.

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MEDICAL JOURNAL, October 5, 1921.

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FIG. 4.—Epithelioma after treatment with endothermy; side view of same hand as in Fig 3.

Preliminary Communication Regarding Steinach's Method of Rejuvenation

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Since my return from Europe I have found the greatest errors to exist regarding the Steinach method of so-called rejuvenation, among physicians as well as laymen. It is frequently confused with gland transplantation, for instance of the monkey gland and with all forms of gland treatments, and unfortunately is deprived by many of the scientific seriousness which it nevertheless deserves as much as any therapeutic discovery.

Many of you have probably noticed the unfortunate tendency among the medical profession to treat the whole subject of endocrinology as a kind of fad without scientific foundation. That is undoubtedly due to many exaggerated assertions which have been made for the results of organotherapy, and also to conclusions for which no scientific basis existed. But shall we cease to use wireless telegraphy because the vibrations of ether are used to explain spiritistic phenomena? Shall we reject endocrinology or treat it lightly because somebody ridicules it, or somebody else treats it as a kind of religious cult, or uses organotherapy for each and every pathological condition? The matter is of too vital importance and the Steinach discovery is certainly one of the most scientifically founded, as well as one of the most promising applications of endocrinological principles.

When Steinach published his work in 1920 on rejuvenation by reviving the aging puberty gland, a sensation was created in Europe which was only feebly reflected in America. As it always happens in discoveries like this, the method and its author were on one hand received with boundless enthu-

siasm and exaggerated hopes were raised; on the other hand, it was ridiculed and became the object of more or less obscene jokes. In some extreme quarters the whole idea was rejected as unethical, as interfering with the eternal laws of Nature, and endangering our morals by producing roués, enabling them to procreate.

After having carefully considered the meagre literature which percolated into this country, I was, as a student of endocrinology, forcibly impressed with the possibilities which the Steinach procedure offered. It dawned upon me, however, that unless I obtained information at first hand, my bias might have caused me unfairly to belittle a therapeutic agency without sufficient knowledge of its practical application. In order to clarify my mind on the theoretical and practical possibilities of this highly important and interesting subject, I undertook the journey to Europe and there came in contact with Dr. Steinach, and his collaborators. My purpose is to acquaint you with the outcome of my studies. I am conscious of the fact that my statements are of the greatest importance, and I also feel confident that my observations and deductions were gained with the necessary criticism and reserve.

I assume that Steinach's former experiments are more or less familiar to you, particularly his publications from 1912 on, wherein he reports his success in feminizing male guineapigs and masculinizing females by castration and implantation of testicles or ovaries. That the sexual characteristics of an animal can thus be completely changed has, in the meantime, been corroborated repeatedly by Brandes, Athias, Goodale, Pezard, Sand, Lipschuetz, Lichtenstern and others. His ideas of rejuvenation by re-

*Read before the Genitourinary Section of the New York Academy of Medicine, November 16, 1921.

viving decreasing gonadal secretion were first conceived and experiments made in the years 1910 to 1912. But considering the tremendous importance of the whole question, Steinach did not publish his remarkable discoveries at that time, but, desirous of acquainting the public only with mature results, deposited his findings with the Academy of Sciences in Vienna in 1912. Only within the last year, after the material had accumulated and ripened, he published his work on rejuvenation. The storm that broke centred around two words, rejuvenation and puberty gland. Steinach's own exact claim is: that "within modest limits the process of becoming senile can be influenced," and in discussing this statement and the "puberty gland," I shall try to explain the theory of the whole matter, and since this is a preliminary report I shall not go into too many details.

The point that so far has not been brought out with necessary clearness is, that by the Steinach operation the patient is given a more or less massive and continuous dose of his own gonadal hormone instead of the hormone of another human being or a monkey by transplantation of testicle or ovary. Whenever the endocrinologist would prescribe a gonadal preparation, this operation in one of its forms would theoretically be indicated. We know, of course, that the gonadal preparations on the market are of little use. The effects following the operation have to be explained by the development of the gonadal hormone and—this is the most important point—its influence on all other glands with an internal secretion. The operation is, therefore, not a treatment for impotence alone, as many think, but for the purpose of reviving and strengthening gonadal secretion which would, of course, find its most favorable application in cases of premature and physiological senility or climacterium virile, which are to a great extent due to decrease of gonadal activity. All symptoms due to senility, including sexual impotence, as a rule improve after the operation, as I will show you later in my clinical reports. A few other possible indications would be: beginning arteriosclerosis, hypertrophy of the prostate, eunuchoidism, mental depression, and cases of dementia præcox, where we suspect gonadal deficiency as cause.

The results that are obtained in cases of senility, especially premature senility, have indeed been sometimes so striking and remarkable that they could most accurately be described as rejuvenation. Still, I personally do not think that this word is very wisely selected, simply because it opens so many possibilities of exaggeration by the laity, that too great a confusion can be, and indeed has been, created. I would say that perhaps a better description of the operation would be to say, surgical retarding of senility. Before I enter upon the theory of the method and the much discussed puberty gland let me describe to you the operation itself. It is easier then to understand its consequences on the sexual organs and on the patient's general condition.

After the usual aseptic precautions an incision four to six cm. long is made right next to the root of the penis over the spermatic cord and parallel to it, the cord being easily felt here. The incision goes

through the skin, fat and fascia, and the whole cord comes into view. From this stage one proceeds with blunt dissection, separating the vas from the accompanying tissues consisting of artery, veins and nerves. Greatest care must be taken to avoid all vessels, especially the very small artery which accompanies the vas. After the vas is laid absolutely bare for the distance of about three centimetres two thick silk ligatures are placed around the upper or distal end, about half a centimetre apart, to guard against a possible loosening through peristalsis of the vas. Another thick silk ligature is placed around the lower or proximal end of the vas. A piece of the vas about two centimetres long is now resected. To retain the function of suspension that the cord normally performs, the proximal stump of the vas is attached to the subcutaneous tissue or tunica vaginalis propria in the neighborhood of the distal end (upper corner of the wound). The skin wound is now closed.

The immediate consequence of this operation is a stasis and absorption of the semen as well as gradual atrophy of the whole spermatogenic apparatus. All the cells forming spermatid atrophy with the exception of the so-called Sertoli—or basal cells—which form part of the seminal epithelium. The interstitial tissue filling the spaces between the seminal canaliculi containing the Leydig cells immediately begins to proliferate, taking the place of the degenerating seminal epithelium. After several months a more or less complete regeneration of seminal cell tissue takes place, but it seems that the hypertrophy of the Leydig cells persists to a certain extent. In a recent publication, Kuntz, of St. Louis, who experimented on dogs, came to the following conclusions (1):

"Degenerative changes in the testis on the operated side occurred in all but one of the dogs which were subjected to unilateral ligation of the ductus deferens. In the animal in which testicular degeneration did not occur following operation the outlet for the seminal secretion was restored. . . . In the dog which was allowed to live 142 days following ligation and resection of the ductus deferens the seminal epithelium was restored. . . . Hyperplasia of the interstitial secretory tissue probably is a constant accompaniment of advanced degenerative changes in the seminal epithelium. It probably does not occur in any case as a compensatory process. Dogs in which the interstitial secretory tissue in one or both testes had undergone hyperplasia showed evidence of heightened sexual excitability."

These dogs were, of course, not senile; therefore, could not show regained youth. I am mentioning these experiments only because they have been done in a very careful, scientific way and confirm Steinach's experiments on rats. It is now almost uniformly accepted that the interstitial secretory tissue of the testicle with the cells of Leydig and perhaps in combination with the Sertoli cells are the hormone bearing, the internal secretion furnishing elements of the testes and this tissue, whatever its exact combination of cells is, is Steinach's puberty gland. So, the expression is not meant to designate an organ, but the tissue or tissues furnishing the internal

secretion of the testicle, in differentiation from the external secretion, the semen. Steinach is not the originator of the theory of the puberty gland, he only used this name to simplify designation; the *glande interstitiale* first described by Bouin and Ancel, and later somewhat popularized by Voronoff, is exactly the same. A great discussion over the puberty gland took place during the recent International Congress for Sexual Sciences in Berlin from the 15th to the 20th of September, which I attended. Some denied that the Leydig cells alone are the incretoric organs and falsely accused Steinach of having asserted that. But Steinach does by no means deny that, for instance, the Sertoli cells take part in producing the hormone. He only denies this function for the seminal epithelium for those cells that form the spermin. This was claimed, for instance, by Stieve, one of Steinach's strongest opponents, but even he admitted during the discussion the clinical effects of the vasoligature, only explaining them in a different way. But since these clinical effects interest us most, I shall not dwell upon the theoretical questions any longer. To repeat briefly: ✓ Vasoligature causes atrophy of the spermatogenic apparatus of the testes—an atrophy from pressure and inactivity. The interstitial tissue, the hormone bearing apparatus, takes its place by way of hypertrophy, and this hypertrophy is now accompanied by those clinical events which equal more or less a rejuvenation, and which differ, of course, according to the case and the constitutional makeup of the patient. And this is what I would like to emphasize: The success or failure of the operation depends not only upon the ability of the puberty gland to renew or increase activity, but also upon the response that the other ductless glands or the whole endocrinological system of the patient will give to the renewed output of gonadal hormone. The puberty gland is not alone responsible for the clinical changes, but these changes have to be understood as caused by the renewed activity of all glands with an internal secretion. Thus the individual differences are apparent. As long as the new activity of the interstitial gland lasts and as long as the other endocrine glands respond to its impulse, the patient's senility is postponed, some of his symptoms of old age disappear—partly at least—or their advance is checked. Instead of giving you a long list of clinical happenings after the operation, let me relate to you a few cases that I have seen personally and that were reported at the previously mentioned congress by Dr. Peter Schmidt, Berlin, out of his own rich clinical material.

CASE I.—A man aged fifty-one complained of feeling exhausted, both mentally and physically, upon the least exertion, various pains of arteriosclerotic nature, failing memory, inability to work. The diagnosis was *senium præcox*, *climacterum virile*. On October 16, 1920, vasoligature of the right side was done. The patient left town and was not heard from until January 5, 1921 (two and a half months later). He wrote then that all his complaints had disappeared; he felt generally well, had gained weight, and had noticed a distinct improvement in his sight. The patient was seen April 18, 1921 (nearly six months after operation). He

looked surprisingly youthful, carrying himself more erect, and was entirely free of any complaints. He entered a new business venture and is enjoying life in general. There was no change in sexual life, which had been lost.

Since January he has gained ten pounds. On May 4 (two weeks later) the patient reported by letter: "I am very glad to state that my general condition has further improved. My troubles have almost entirely disappeared. The formerly unbearable pains in my back, muscle twitchings, pains in my testicles, difficulty in breathing, especially on slight exertion, have disappeared. I have not noticed any more weakness of memory, congestions of the head and attacks of vertigo, as well as mental depression. I have gained ten pounds within the last three months, and I look forward with pleasure to my daily work instead of with disgust. The so far unnoticed increase of sexual activity has suddenly since about a week appeared in extraordinary strength, something I have not experienced for fifteen years. I cohabit once daily with excellent erections and feel no exhaustion following. I wish to state my report is exceedingly conservative and in no way exaggerated. I have been medically treated for years without success and felt quite hopeless; even in this operation I had no confidence, but I must admit that its effects have surpassed my boldest hopes."

He was seen June 6, 1921. His general condition continued good. His appearance was that of a man of forty. The greatly increased libido and potency persisted in this intensity for somewhat over a week and then went back to the norm of about his thirtieth year. Coitus three times a week. In spite of the summer heat, from which he suffered much formerly, the patient is very active and able to work. He has gained another two pounds. A letter from him July 6, 1921 (eight and a half months after operation) reads: "My condition is unchanged and am feeling exceedingly well."

CASE II.—Man, aged thirty-one, *impotentia somatica*, with very rare erection and late ejaculation. None of the consulting neurologists, psychiatrists or sexologists could make an exact diagnosis.

On December 13th, a vasoligature of the right side was done. Until April, 1921, the condition remained unchanged. On April 12th (four months after the operation) there were more frequent erections, quicker ejaculations were noticed. He felt unusually well. On May 24, 1921 (six weeks later), the very sceptic patient stated that the erections were prompt, frequent. The patient had married within the past few weeks and was happy to prove his potency. He had gained ten pounds in weight, in spite of unchanged mode of living and food. On July 20th (eight months after operation) his wife was pregnant.

CASE III.—B., man, building contractor, aged forty-seven years, complained of tiredness and inability to do any physical work. He fell asleep in his chair in the forenoon. Memory rapidly deteriorating. In spite of better nourishment during the past two years (after the war) he lost fifty pounds in weight. Sexual activity decreased, coitus once a month without pleasure. The patient was unable to earn

his living. The physical examination showed an emaciated, aged man with tired facial expression, hair gray on temples, hands and ears cyanotic and cold, weight 100 pounds, systolic blood pressure 135, urine negative, internal organs and nervous system negative, Wassermann negative, no history of venereal disease. Diagnosis, senium præcox, beginning arteriosclerosis.

On February 7, 1921, vasoligature on the right side was done. On February 17th the stitches were removed. Weight sixty-six and a half kilos. His hands and ears were redder and warmer. On March 10th (one month after operation) weight seventy-one kilos, systolic blood pressure 121.

He stated: "I can count today the tiles on the roof of the opposite house. Five weeks ago I could see them only as a blurred mass. I am feeling as well as in former years. My mind is clear. The tiredness has disappeared. I can work as before. Previously I had not had coitus for half a year; now I feel such a strong impulse that I cohabit almost daily with a great sense of pleasure. April 4th, report by letter: "I am sorry I am unable to come to Berlin this week. I feel well and strong. My appetite is good. Sleep well. Can work as well as before. I am very grateful that you have made a man of me." On April 15th (two and a half months after operation), weight seventy-three kilos (increase eight kilos). Has a surprisingly fresh look. Complexion rosy and shows a new turgor. He looks surprisingly young for a man of forty-seven. He is working daily from 4 a. m. to 6 p. m. in the fields. In spite of the hard work he has frequent sexual desire. May 8th (three months after operation) the following letter, with a repetition of his history was received: "My weight decreased since 1919. Our physician diagnosed arteriosclerosis. I grew worse daily and did not know whether I was dead or alive. I was always tired and still could not sleep. I was shrinking away to nothing. Everyone who saw me said I looked like a man of eighty. You won't last much longer. My clothes fitted me twice. I went to Berlin for advice. You operated on me February 7th and after a short time I could take up my work again. I am looking young and fresh again, in spite of my hard work and my suit of clothes fits me once more. I have healthy sleep and sexual intercourse as formerly."

A letter June 7th (four months after operation). Weight seventy-three kilos. Mental and physical ability to work. Coitus three times a week. "I have gone back to my old occupation and have established myself as a building contractor on a larger scale." July 7th, condition good, unchanged. July 11th, two patients from his home town came to the office and related independently of each other that B is so changed that his former friends can hardly recognize him.

Case IV.—J., fifty-four years, packer. He had lues in 1887; he was treated by inunction. There were no later symptoms. In 1916 he had polyarthritides rheumatica with endocarditis, later difficulty in breathing, but feet never swollen. Had lost forty kilos between 1914 and 1916. Afterward there was an increase; for the past year weight seventy kilos. In August, 1920, he consulted a physician for

air hunger and pain between the shoulder blades. A diagnosis of arteriosclerosis, with aortic and mitral insufficiency (following endocarditis) and syphilitic aortitis was made. Wassermann four plus. Was given potassium iodide and then a careful combined antisyphilitic treatment. Since beginning of April there were frequent attacks of dyspnea day and night and sticking pains radiating into shoulders lasting from five to twenty minutes. The patient was in the greatest financial distress, could not work, had continuous pain in back and lumbar region. Falls asleep frequently during the day, insomnia at night, memory very weak, no sexual activity for over a year.

Physical examination showed an emaciated, senile man, with tired, depressed face, hair mixed red and white. Weight seventy-two and a half kilos, blood pressure 150, systolic, dynamometer 60. Urine negative, the heart showed hypertrophy and dilatation of both ventricles. It measured horizontally nineteen cm., obliquely twenty-one cm. and showed an enlarged aortic arch. The pulse was quick and high in the sphygmogram and distinctly audible on auscultation. The eyes showed arcus senilis on both sides. He could read with glasses a distance of three and a half metres letters seven mm. in size. Leucocytes 9,600, erythrocytes 5,580,000. The Wassermann was four plus.

The diagnosis was aortic insufficiency, aortitis leucica, arteriosclerosis, cachexia universalis (presenilis). The patient was absolutely unable to work. His general appearance was so poor that antiluetic treatment seemed contraindicated. Iodides were given off and on without success. After long hesitation vasoligature was done under local anesthesia. The operation was undertaken April 26th, remembering the success that Lichtenstern had described in a case of severe stenocardia. On May 6th the stitches were removed. Weight seventy-three and a half kilos. Blood pressure 143. Patient felt weak, had one light attack. On May 13th no attack, felt better. Said he felt his blood circulating better. On May 20th weight seventy-four kilos, blood pressure 145, dynamometer 60.

June 2nd (one and a half months after operation) blood pressure 140, weight and dynamometer unchanged. He read without glasses at a distance of three and a half metres letters five mm. in size. Since a few days erections had appeared as they have not in years, the appetite was better, slept well in daytime (had a job as night watchman). "I feel well. Everyone says, 'You look blooming.'" His attacks of dyspnea and pain were frequent, but were quickly cut short by inhalation of amyl nitrite. On June 5th several nocturnal emissions. Patient looked changed and had a new turgor. Leucocytes 7,400, red cells 5,304,000. On June 16th weight seventy-five and a half kilos (three kilos increase), blood pressure 155, dynamometer 73. He stated: "My eyesight is clearer. I can read newspaper without glasses."

Reads without glasses at a distance of five metres letters five mm. size. "If I could only get rid of my attacks. Otherwise I feel as well and strong as never before." June 23rd reported by letter: "I report with great pleasure that my attacks have

ceased since the 19th." June 28th, weight seventy-six kilos. Between the 19th and 25th no attack whatever. The patient looked so changed that a control photograph was taken. July 26th (three months after operation), weighs seventy-seven kilos (increase since operation four and a half kilos), blood pressure 138. It is striking that the hair that was formerly of mixed color and thin has now grown thicker and darker. Increase in libido sexualis was persistent and the patient had had nocturnal emissions five times. He has been advised not to cohabit. The stenocardiac attacks came almost nightly during his night work, but were controlled more promptly. They did not affect his general health. His looks and movements had changed in such a manner that they could best be described as rejuvenation.

I could continue to relate histories of successful cases I have seen, but these five¹ may be sufficient to describe the usual change of symptoms. To repeat, the most constant symptoms are gain in weight, growth of pigmented hair, increase in libido sexualis and potency, improvement of memory as well as physical and mental vitality, improvement of eyesight.

Whether a prolongation of life is obtained is impossible to say. So far, in no one of the successful cases has the patient come to a second senility or has died, except, of course, of intercurrent diseases like pneumonia. A much larger number of cases must be observed to pass judgment on this question. But one thing can be said already, as based on experience: Man's life of activity, that part of man's life where he works and creates, can be prolonged in many instances and it seems to me that this is the important fact. From my own observation, I might say that from about ten per cent. to twenty per cent. of the patients operated on showed no results whatever. Of the remaining, it seemed to me that about half were so remarkably improved that only the word rejuvenation could describe the effect. The other half improved sufficiently to justify the operation.

But I will not tell you only of successful cases. The failures are just as important, and there have been many cases which showed little, and some which showed no results whatever, as I have mentioned already. Their interpretation is as yet quite difficult. Possibly the technic was at fault. Maybe small bloodvessels were not preserved carefully enough. Some patients might have been too old and no hyperplasia of interstitial tissue took place, or perhaps toxic causes, like former infections, prevented it, or—and this group of failures is possibly the largest one—the response of some or all endocrine glands to the revived puberty gland was missing. Future studies will have to clarify our conceptions and perhaps give us the means to draw the indications for the operation closer.

Regarding contraindications, I would like to say that, generally speaking, all cases where gonadal therapy is contraindicated would be unfit for operation; for instance, cases where a general breaking down of the cardiovascular apparatus is suspected and where we would not like to subject such an apparatus to the strain of newly created activity.

Likewise, patients with advanced senility with atrophic genitals, where we can not expect any regeneration, should not be operated upon. It is also advisable to be careful in the dosage of the gonadal secretion that you give the patient in ligating the vas. The expression dosage probably sounds strange, but it is indeed possible by a variation of the surgical procedure to control the quantity of hormone which the operator intends the patient to receive. In case it is deemed advisable to sterilize the patient completely, bilateral operation is performed. In the majority of instances a unilateral vasoligature is adequate to produce the desired effect, and this naturally will not destroy the patient's ability to procreate.

For instance, in cases of sexual impotence due to dysfunction or hypofunction of the puberty gland as in the two cases I related, this one sided operation would be the only one to be considered.

Harmful results have been very rare and of those that came to my notice it was very doubtful whether the Steinach operation had anything to do with those results. Some patients have died within a few months after the operation. None of these deaths can positively be attributed to the operation itself. Some of them had surely nothing to do with it, at least not directly. I like to mention here one case which has gained quite some notoriety in the press. I am referring to a Mr. Wilson who was operated on and after having shown remarkable improvement wanted to lecture on his own case and praise Steinach, when he suddenly died in London. His death was unfairly used against Steinach. I am in the position to state that this Mr. Wilson was indeed one of Steinach's most successful cases and that he died of acute pneumonia. I have heard that he had been so overjoyed with his newly gained physical and mental strength that he overdid his enjoyment of life and that might have resulted in exposure and final contraction of pneumonia.

Patients should, therefore, be warned not to change their mode of living too quickly and radically. I know of a similar case in Berlin: a restaurant owner, sixty-two years old, chronic alcoholic, was operated upon during November, 1920. He had then various symptoms of senility, disabling him entirely, moderate hypertrophy of the prostate and a chronic cystitis. His blood pressure was 185. Three months later the patient showed remarkable improvements. He was working late every night, was drinking more than ever, his formerly purely white, coarse hair had become softer and was mixed with many new darkly pigmented hairs. In March his blood pressure was 175. In April (five months after the operation) he died of an apoplectic stroke. How far the operation or, better, the success of the operation was responsible is an open question.

Interesting private reports have reached me concerning results in cases of cancer. It is said that recurrences were possibly prevented through the vasoligature, and that cases where the surgeon refused a major operation on account of the patient's poor, general condition the vasoligature was done, and the general improvement was so marked that a few months later a successful cancer operation could

¹ A report of the fifth case will appear in the author's reprints.

be performed. I have mentioned these facts only to show certain possibilities. I am not drawing any conclusions or forming any theories.

You will notice that all my statements refer to men only, but on the same principle a treatment for women is also possible, only not by any surgical procedure, but by use of the x rays in such a way that we destroy the sensitive generative tissue of the ovary by properly selected doses, and thus cause hypertrophy of the more resistant cells that form the ovarian hormone. Many gynecologists have observed the fact that women who were treated with x ray for fibromata of the uterus, and other conditions, showed so remarkable general improvements that they were described as new youth. They ascribed the success to the cure or improvement of the disease, but in the light of Steinach's discovery these observations appear in an entirely different aspect, and most likely deserve a different interpretation. Still, our clinical experience with women as yet is not as complete as that with men, but there is no reason for them to despair of the possibility of sharing in the benefit of Steinach's discovery.

In conclusion, and taking everything into consideration that I have seen, heard, and read, I have no doubt whatever any more that the Steinach operation deserves to be taken very seriously and not only that but deserves to be used as a very valuable therapeutic agent. Exactly to what extent and with how many indications and contraindications the future has to teach us. Perhaps the range of indications will be even wider than we think now. A warning should be sounded against too great an enthusiasm and against raising too many hopes. Steinach's own words should be remembered: "that within modest limits the process of becoming senile can be influenced." But on the other hand so many facts in favor of the method have objectively and actually been observed that we cannot deny them any more. As I said before, it will be a matter of future study to determine its exact value to the individual and to society in all its economic and social consequences.

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The Restoration of Hand Injuries by Plastic Surgery

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New York.

The poor end results so frequently obtained from operations on the fingers and hands have led me to take special interest in this field of surgery. Injuries to the hand are among the most common lesions with which a surgeon has to deal. It is surprising, however, that the surgeon, who usually does such skilful abdominal surgery, does not get equally good results in his work on the hand. This deplorable condition is due mainly to lack of experience, and, to a great extent, to ignorance of the anatomy of the parts.

Treatment of injuries of the hand are divided into two classifications: 1, those for the immediate repair; 2, those for the final restorative treatment. This paper deals with the second classification, and its scope is to illustrate the operations which I have performed, showing the end results obtained. I have had very good results in restoring hand injuries in which there was a loss of soft tissues resulting in contractures, especially on the palm and flexure surface of the finger, by the use of pedunculated flaps which may be taken according to its most adaptable location, viz., from the abdomen, thorax, back, thigh and buttock. This is the only type of graft which promises permanent results, on account of the excellent pressure bearing surface it provides.

There are certain principles, the observation of which is vitally necessary for the success of the final result. Each is so important in its particular way, and all are so interdependent, that the loss of one will diminish the value of the other.

To begin with, all scar tissue must be entirely

removed. To insure the best results in obtaining a viable pedicle graft, the graft should be as broad as possible, and not longer than three times the width of the pedicle and cut at least one third larger than the area to be filled, as there is always immediate shrinkage. The selection of the skin to be transplanted must be made with some regard to the character of the skin surrounding the area into which it is to be placed, especially avoiding the use of hairy skin on hairless portions of the body. The sooner operation can be performed after the injury has been sustained the better; and, if possible, before trophic changes in the joints takes place.

INJURY TO HAND WITH LOSS OF FINGER TIP.

In a large number of occupations, especially among musicians, the shortening of a finger, even ever so little, would greatly lessen its value, as conservation of function must always be kept in view. I have had good results following the simple plastic operation about to be described; and have succeeded in retaining the original length of the finger, after the loss of soft tissue, by partial traumatic amputation of the terminal phalanx.

The best method of early treatment, especially when the bone is exposed, is to raise a single pedicle flap with a lateral attachment to the palmar surface of the finger near the wound, and suture it to the opposite side of the terminal phalanx providing a good pressure bearing surface. If we allowed the entire wound to heal by granulation, there would be a sensitive stump, the bone being covered only by scar tissue, while shortening the bone would naturally give a shorter finger.

CASE I.—Charles T., aged sixteen years, was admitted to the City Hospital, September 3, 1919. While chopping meat, he accidentally amputated the tip of the middle finger of the left hand, the end of the finger being off obliquely quarter of an inch beyond the wound (Fig. 1). The wound and skin

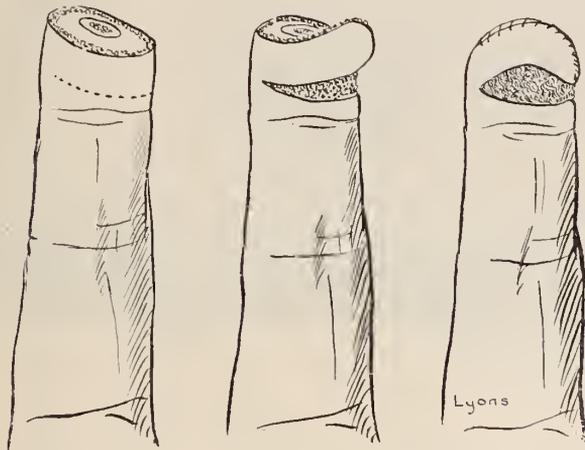


FIG. 1.

FIG. 2.

FIG. 3.

FIG. 1.—Injury to hand with loss of finger tip, showing tip of finger cut off obliquely through the nail, dotted line indicating the site of incision. (Case I.)

FIG. 2.—Showing pedicle flap raised with single lateral attachment. Same patient as in Fig. 1.

FIG. 3.—The free end of the pedicle flap is shown sutured at the opposite side of the finger. Same patient as in Fig. 1.

surrounding it were surgically prepared. A transverse incision (as shown in Fig. 2) was made, and a flap of skin and subcutaneous tissue raised with a single pedicle attached. The free end of the flap was sutured to the opposite side of the finger (Fig. 3). The flap lived in its entirety. The sutured edges were united by primary union, and the resulting raw surface left to granulate. The patient left the hospital in fourteen days with the finger entirely healed.

INJURY INVOLVING DORSUM OF HAND.

The pocket method of closing skin defects was used in this type of injury. This method of skin grafting consists of raising a bridge of skin and subcutaneous tissue from the underlying aponeurosis, inserting the part to be grafted, and fixing it there until union between the raw surface has taken place, when the two pedicles are cut. It is very important to take a Wassermann test and never to operate where there is an active syphilitic process. This method is indicated when it is necessary to cover large skin defects of extremities, as after injuries of hand, wrist, finger or foot, especially about their joints; to remove cicatrices which bind down tendons and interfere with action of muscles or their tendons; and to restore flexion or extension.

CASE II.—The patient, G. M., a female, aged twenty years, came under my care about October 1, 1917, and was admitted to the Park Hospital, October 6, 1917. Family and past history were negative. While working in a laundry, about two and a half months before her admission to the hospital, the patient's right hand was caught in a mangle. The skin and subcutaneous tissue were torn off the dorsum of the hand, exposing all the extensor tendons. The wound refused to heal. The

extent of her injuries is clearly shown in Fig. 4. In addition to the skin defect, due to cicatricial contraction of the dorsum of her hand, the extensor tendons were fixed, so that she was unable to close her hand. This made the indications for the operation two fold: 1, to cover skin defect; 2, to prevent contraction.

Preparation of the patient.—My first effort was to improve her health and strength by general hygienic, dietetic and tonic measures. The operation which I planned for her relief was to transplant from the abdomen to the dorsum of the hand, a strip of normal skin, broad enough to fill the gap left after excision of the scar tissue, binding the extensor tendons and allowing the flexor tendons to act in the closing of the hand.

Preparation of the wound.—The skin of hand and abdomen was surgically prepared. At the first step of the operation all the cicatricial tissue was removed. Then the edges of the wound were freshened and elevated, allowing them to retract away from the field, so as to free the field far above and below, thus preparing the bed for the transplant.

Technic.—Two parallel vertical incisions were made extending from a little below the left nipple to a line on the level with the umbilicus, cutting down to the aponeurosis of the abdominal muscles, including in the flap the entire thickness of the skin and subcutaneous tissue of the abdominal wall. The formation of adhesions is prevented by the fat which is present in the flap. The far edges of the wound were sutured together under this flap, so as to restore the continuity of the abdomen.

The patient's hand was now passed beneath the flap, with the palm facing the abdomen and the dorsum in contact with the under surface of the flap. The skin edges of the hand wound were sutured to the flap, which must be gently handled, carefully adjusted, and precisely sutured, as accuracy of opposition is essential. From the natural contractility of the skin, it contracts and shrinks considerably, so



FIG. 4.

FIG. 5.

FIG. 4.—Injury to hand involving the dorsum, showing condition of the hand before operation. (Case II.)

FIG. 5.—Showing condition of the hand six weeks after operation, the sutured edges were united by primary union leaving only a faint scar. (Case II.)

it must, therefore, be a third wider than the defect to be filled, and longer than apparently necessary to avoid undue contractility on the pedicles. Perfect hemostasis, strict asepsis and antisepsis are

necessary to assure success. The flap lived in its entirety. The sutured edges were united in primary. The cut edges of the flap bled freely, which spoke well for a successful outcome. The freshly cut edges were now sutured to the hand and a dry gauze

sightly and awkward scar of a granulating surface (Fig. 5).

The advantages of this method far outweigh the disadvantages of a two stage operation.

1. The blood supply from two pedicles insures the



FIG. 6.—Injury to hand involving palm and fingers; showing condition of the hand before operation. (Case III.)

FIG. 7.—Showing the degree of voluntary extension after operation. (Case III.)

FIG. 8.—Showing the degree of voluntary flexion after operation. (Case III.)

FIG. 9.—Showing condition of the hand six weeks after the second operation. The sutured edges were united by primary union leaving only a faint scar. (Case III.)

dressing held in position by a bandage applied. The position in which the hand is held is very comfortable. The hand and arm must be kept perfectly still for fifteen days, and the best way to procure this immobilization is to hold the arm against the abdomen with adhesive plaster.

The graft is released from its pedicle fifteen days after the operation. Under local anesthesia on the fifteenth, both pedicles of the bridge flap were entirely severed and the hand released from the abdomen. The cut edges of the flap bled freely, which spoke well for a successful outcome. The freshly

necessary viability. 2. There is no stimulation of the connective tissue formation and resultant cicatricial contraction. 3. The presence of fat in the flap prevents adhesions to the tendons below. 4. The raw surfaces are approximated and held in position with ease. 5. The two pedicles act as splints to hold the grafted portion in position. 6. At least six weeks are saved in healing time. 7. The excellent pressure surface is of great advantage in this part of the body, exposed as it is to rough usage, traumatism, constant flexion, and extension. 8. Finally, it is the method of choice when the sliding method is impracticable.

INJURY TO THE HAND INVOLVING THE PALM AND FINGERS.

CASE III. — Charles W., aged forty-two years, caught his right hand in a sandpapering machine. The skin and the subcutaneous tissue of the entire palm and the flexor surface of the thumb, fourth and fifth fingers were torn off, exposing the flexor tendons. The wound was not sewed. A vaseline dressing was applied by the physician then in charge. The flexion contraction of the thumb, third and fourth fingers



FIG. 12.—Injury to hand with scar contracture of fingers. Showing condition of hand before operation, with deformity the result of a contracting cicatrix of finger. The tendons were not involved. (Case V.)



FIG. 10.

FIG. 11.

FIG. 10.—Injury to hand with bone involvement. X ray photograph showing old dislocation of middle phalanx of little finger.

FIG. 11.—X ray showing the dislocation reduced. (Case IV.)

cut edges were now sutured to the end and a dry dressing applied.

Final result.—The skin defect is perfectly covered. The patient is able to flex and extend the fingers. The hand grip is strong; the esthetic effect is marked. The only scars shown are the suture lines at the union of the flaps, replacing the un-

had developed as shown in Fig. 6. The fingers and thumb could not be extended voluntarily or passively, because of the resistance of the scar tissue contraction on the flexor surface.

This is one of the most unfortunate conditions which one can encounter in the hand, owing to the

cicatricial contraction which usually takes place following lacerations of the palmar structures. The excessive formation of connective tissues here is a quite regular occurrence with the production of a dense scar. The usual places where similar scars

Second operation.—The scars on the flexor surface of the fingers not having been removed at the first operation, it became necessary to do this, as these scars would break down and ulcerate when pressure was brought to bear upon them. The second operation was performed on October 8, 1919. The skin of the hand and abdomen were surgically prepared, the scar tissue extending on the palmar surface of the fourth and fifth fingers was removed, and the edges of the wound freshened and elevated, allowing them to retract away from the field so as to leave it free, thus preparing the bed for the transplant. As the skin between the fingers was destroyed at the time of the accident, it was necessary to make a new web. A tongue-shaped pedicle flap was made, one third wider than the width of the fourth and fifth fingers, with the pedicle upward, including the entire thickness of the skin and a little of the subcutaneous tissue, from the side of the abdomen and infracostal region. The patient's hand was now placed on the abdomen and the skin edges of the hand wound were sutured to the flap, which must be gently handled, carefully adjusted, and precisely sutured, as accuracy of apposition is essential. The hand and arm were immobilized with adhesive plaster. Fourteen days later the pedicle was cut. A new web was constructed from the transplanted

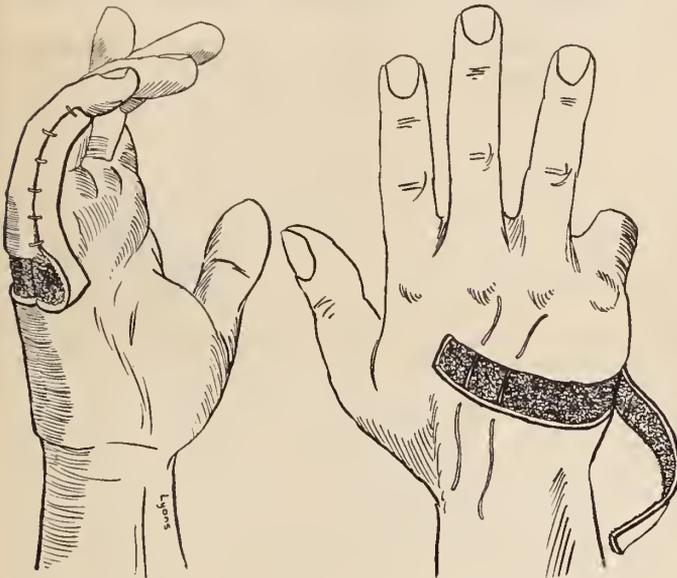


FIG. 13.

FIG. 14.

FIG. 13.—Showing the free end of the pedicled flap sutured to the fingers. (Case V.)

FIG. 14.—Showing sutures for closing of the wound which, when tied, brings the skin edges together beneath the elevated pedicle flap. (Case V.)

may form are on all flexor surfaces, in the neck, in folds of the wrist, elbows, popliteal space, etc., because they are subjected here to frequent repeated extension and flexion. The evil consequences of a scar lead to contraction.

Operation.—First dissect away all the scar tissues. The next step is to undermine freely the edges of the wound, then fill in the defect left from the scar excision by a slightly larger piece of normal skin. Such a piece of skin was secured by transplanting a pedicled flap from the front of the abdomen which had been surgically prepared. For location of incision see Fig. 22.

Dressing.—The arm and hand were immobilized across the body in a comfortable position, with a wide strip of adhesive plaster, to keep the patient from drawing away the hand from the flap, and preventing the flap from being torn loose. The hand and arm must be kept perfectly still for fifteen days after the operation. Under local anesthesia, on the fifteenth day the pedicle of the flap was entirely severed and the hand released from the abdomen. The cut edges of the flap bled freely, which spoke well for a successful outcome. The freshly cut edges were now sutured to the hand and a dry dressing applied.

Result.—The patient was able to flex and extend the fingers. The hand grip was strong. The skin in the palm was entirely covered. Gradually the transplanted skin flap became toughened to meet the demands of pressure placed upon it and he had a very excellent pressure bearing surface in this transplanted tissue.



FIG. 15.—Injury to hand with scar contracture of fingers. Showing condition of hand before operation. (Case VI.)



FIG. 16.—Showing condition of hand eight weeks after the operation. Sutured edges of pedicled flap were united by primary union. (Case VI.)

graft between the fingers (as shown in Fig. 20) and sewed in place, which healed by primary union. The skin graft in place is shown in Fig. 9.

INJURY TO THE HAND INVOLVING THE BONE AND JOINT.

CASE IV.—Miss Jeannette I., aged twenty years, while walking in the street on March 30, 1919, stumbled over a railroad track and fell to the ground,



FIG. 17.—Injury to hand with tendon involvement, showing the degree of voluntary extension. (Case VII.)

dislocating the middle phalanx of the right hand (Fig. 10). No attempt was made to reduce the dislocation until she was referred to me about nine weeks after the accident.

Operation.—On June 9, 1919, operation was performed under general anesthesia, as it was impossible to reduce the dislocation without an open operation. A two inch longitudinal incision was made along the outer border of the fifth finger, and the joint exposed and opened. It was found necessary to resect the head of the middle phalanx and the capsule was interposed to prevent adhesions in the joint, allowing free motion. The wound was closed and the finger immobilized until the skin wound healed, when passive motion was begun (Fig. 11).

INJURY TO THE HAND WITH SCAR CONTRACTURE OF FINGER.

CASE V.—J. U., male, aged twenty-nine years, was admitted to the Penitentiary Hospital on June 10,



FIG. 18.—Showing the degree of voluntary flexion after operation.

1919. When he was eight years old he fell on a hot stove and burned his right hand. The wound healed slowly, leaving a marked flexor contracture of the fifth finger. The extent of his injuries is clearly shown in Fig. 12. Owing to the skin defect, and as a result of the cicatricial contraction, the finger

was drawn down to the palm, preventing forcible extension. The scar extended to midline of the finger from the second phalanx across the palm to the second proximal flexor crease of the hand. This median scar was ridgelike and consisted of dense cicatricial tissue which had contracted so that it interfered with his work.

Operation.—The skin was surgically prepared. Under general anesthesia, as the first step of the

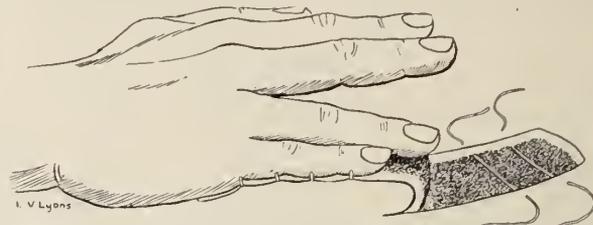


FIG. 19.—Showing the pedicled flap from the abdominal wall sutured to the finger. The sutures for closing the wound when tied bring the skin edges together beneath the elevated pedicled flap.

operation, all cicatricial tissue was removed. Then the edges of the wound were freshened and elevated allowing them to retract away from the field, thus preparing the bed for the transplant. The raw surface left by removing the scar tissue was filled in by a single pedicle flap obtained from the back of the same hand and stitched to the edges of the finger (Fig. 13). Fourteen days later the base of the flap was divided and the flap sewed to the proximal portion of the skin wound in the flexor surface of the finger. The wound on the back of the hand was closed (Fig. 14). The transplant healed in soundly.

CASE VI.—William S., colored, aged twenty-five years, was admitted to the Penitentiary Hospital on April 22, 1920, with severe laceration and contusions of the middle finger of the right hand, incurred while at work on the coal boat at the Penitentiary, B. I.

The finger became infected, and the hand was involved. Palmar incisions were made and drained. The infection spread up the arm to the elbow. On May 1, 1920, the middle finger was amputated at the metacarpal phalangeal joint. On June 28, 1920, the patient was discharged with a contracture of the ring finger of the right hand due to scar tissue involving flexor tendon. On August 31st he was readmitted to the hospital for plastic operation.

Operation.—Skin was surgically prepared. Under general anesthesia, scar tissues were removed from flexor surface; ring finger, right hand, adhesions broken in palm; skin, tongue shaped, pedicle flap



FIG. 20.—The dotted line shows the outline for the incisions necessary in making a new web between the fingers.

with pedicle upward was made through subcutaneous tissues of the left side of the abdomen in the infra-costal region. The flap was sewed to the denuded surface of the finger, and the hand and arm were immobilized with adhesive plaster. Fourteen days later, pedicle cut redundant tissue removed; wounds

warrant the adoption of an operative procedure in two stages; a first stage when the tendons are united and six weeks allowed for the union of the parts; and a second stage when the resulting adhesions are divided and passive motions begun immediately upon the wound.

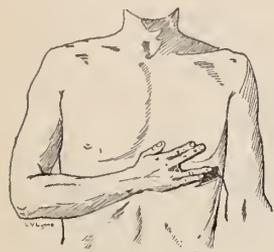


FIG. 21.

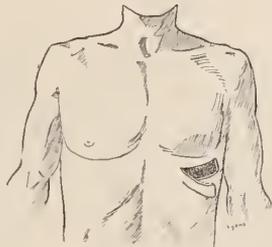


FIG. 22.

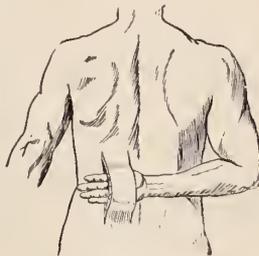


FIG. 23.

FIG. 21.—Showing pedicled flap from the abdominal and chest walls sutured to the fingers.

FIG. 22.—Showing the raised pedicled flap on the abdominal wall.

FIG. 23.—Showing the hand passed beneath the double pedicled flap with the palmar surface in contact with the under surface of the flap and the dorsum facing the back. The skin edges of the hand are sutured to the skin graft.

were sutured and hand and abdomen were dressed.

The patient was discharged from the Penitentiary Hospital on September 21, 1920, and was instructed to report to the City Hospital for further treatment. At the time of departure the skin graft was healed by primary union.

HAND INJURIES WITH TENDON INVOLVEMENT.

Before repairing the divided tendons, in injuries to the hand, the deformity resulting from scar contraction should be excised and replaced with a pedicle skin flap. I have had the best results following the repair of cut tendons by dividing the operation into two stages. The advisability of a two stage operation for repair of severed tendons, in the hand, first presented itself to me in 1914. I had occasion, at that time, to operate on a patient whose flexor tendon of the index finger had been severed some two months previously. There had been no attempt made, at the time of the injury, to suture the tendon, and the result was a finger not only useless but always in the way and interfering with the function of the hand.

After having operated to relieve the condition, I was much disappointed, six weeks later, to find that there was no restoration of function, and the finger was practically as bad as before. I naturally inferred that the sutured ends of the tendon had separated and operated the second time, with the idea of again picking up the tendon ends. At the second operation, I found the tendon intact but voluntary motion prevented by adhesions. Ten days after the tendon was cleared of these adhesions, passive movements were instituted and a satisfactory result obtained, which has continued to the present time.

I believe this case, and several analogous cases,

ends. A wound is generally transverse; and, if it is necessary to enlarge it, the lateral and curvilinear incision should be employed, because the usual longitudinal incision in the median line of the palmar surface often results in progressive contracture with permanent flexion.

The wound edges being retracted, the distal end of the tendon is readily found, as it does not contract to any great extent. The proximal end, however, often retracts beyond view. Sometimes, after flexing the finger, a closed forceps can be passed up through the sheath to where the tendon can be



FIG. 24.—Showing palmar surface of the hand with the pedicled flap sutured to the fingers and palm.



FIG. 25.—Showing dorsal surface of hand with new web between the fingers sutured in place, also the lateral edges of the pedicled flap sutured to the sides of the fingers.

felt and caught, and then brought down to view. If the retracted tendon cannot otherwise be brought down, an incision can be made opposite the point of retraction, a stitch passed into the tendon end, and, by means of an old fashioned large eyelet probe, brought down through the sheath. Lateral, short

incisions into the fibrous sheath are to be preferred to one long continuous one which might permit prolapse of the tendon. The retracted tendon when located should be drawn through its sheath downward through a lateral incision and an eighth of an

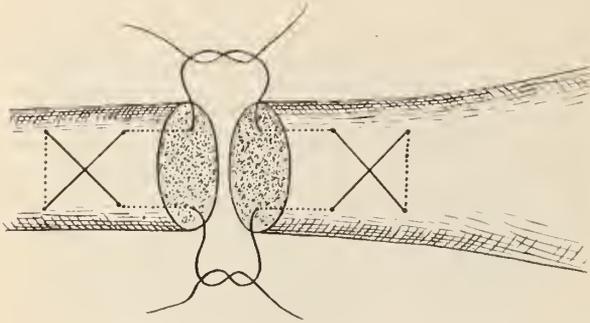


FIG. 26.—Showing suture in place, knots only partly tied.

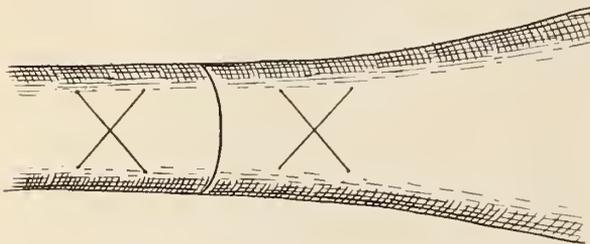


FIG. 27.—Showing suture tied, the knots buried between cut margins of tendons.

inch trimmed off each end so that no dead tissue intervenes when the cut surfaces are finally opposed. We are now ready to insert the special sutures and when they have been placed, the tendon ends are returned to their sheaths and the sutures tied.

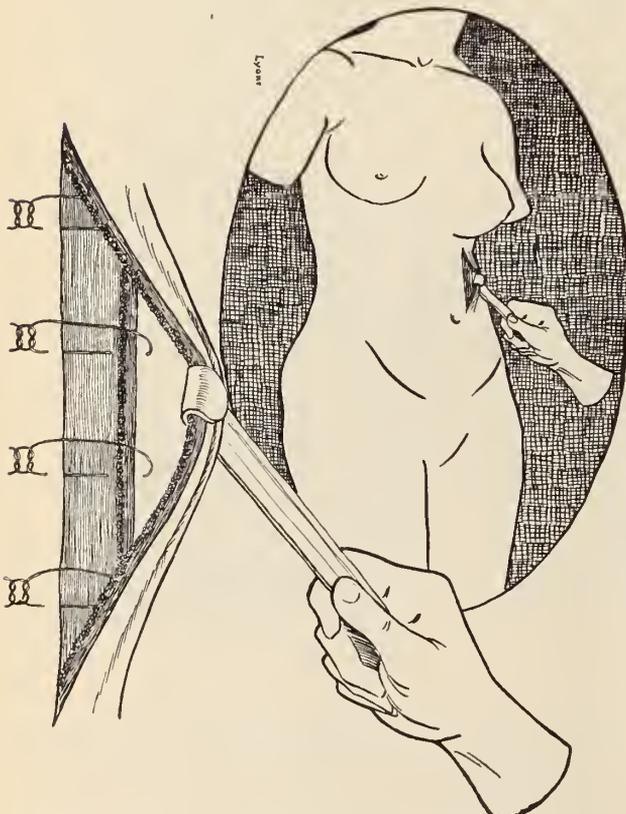


FIG. 28.—Skin graft freed above and below and raised by retractor showing sutures for closure of wound behind graft.

CASE VII.—Miss Irene D., aged twenty-one years. In January, 1914, the flexor tendons of the left index finger were cut across at the junction of the proximal and middle phalanges, and at the time of the injury no attempt was made to suture the tendon. The patient was referred to me about six weeks after the injury and the tendons were sutured. I was much disappointed six weeks later, after having operated, to find there was no restoration of function, and the finger was practically as before. At a second operation, six months later, I found the tendons intact, but voluntary motion prevented by adhesions. Ten days after, the tendon was cleared of these adhesions, passive movements were instituted, and a satisfactory result was obtained, which has continued up to the present time. The accompanying photographs (Figs. 17 and 18) show the degree of voluntary flexion and extension obtained after operation.

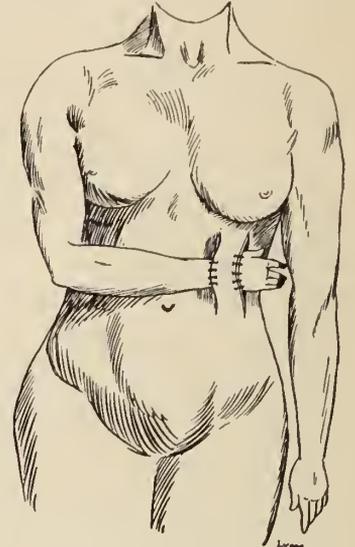


FIG. 29.—Hand passed beneath the flap with the palmar surface facing the abdomen and the dorsum in contact with under surface of the flap. The skin edges of the hand are sutured to the skin graft.

TECHNIC OF FULD'S STITCH.

The needle enters the tendon on its lateral surface half an inch above the cut end, passes transversely through half the thickness of the tendon to emerge on the opposite side. The needle then enters the tendon on its anterior surface, at a point quarter of an inch from its cut and three fourths of the distance across the tendon. Perforating to half its anteroposterior thickness, it passes longitudinally through the length of the tendon emerging at its cut end to one side of the median line (Fig. 19). The free end of the silk is crossed diagonally over the other suture, perforates the tendon quarter of an inch from the cut and passes through the length of the tendon and emerges on the other side of the median line. Sutures are now passed in similar fashion into the other end of the cut tendon, and then tied to corresponding sutures opposite; bury the suture knots between the approximated tendon ends (Fig. 26).

Where the two severed tendon ends cannot be brought together because of muscular contraction, or because they are deeply buried in dense fibrous tissue, I have obtained good functional results by removing the injured segment, and inserting a graft of tendon with its sheath. A strip of the tendo Achillis may be used. The tendons of the palmaris longis, the flexor sublimis digitorum, and the extensor communis digitorum can be easily dissected with their sheaths and make excellent grafts for tendon defects in the hands and fingers. The tendon sheath is then sutured with fine catgut (Figs. 26 and 27).

Provided the wound is healed, passive movement can be commenced at the end of three weeks. Voluntary motion should not be begun before the end of six weeks, as it has been demonstrated by animal experimentation that it takes six weeks for a cut tendon to be firmly united. Before that time, newly united tendon will stretch with loss of good functional results.

Passive movements should be made with as long excursions as possible, and the best results are obtained if these passive movements are alternated with absolute rest. Even though passive movement has been started at the end of three weeks, and voluntary motion attempted at the end of six weeks, the development of adhesions is almost inevitable, making necessary the second stage of this operative procedure.

In three of my cases, the tendon had united perfectly, yet adhesions had interfered with function and a good result was only obtained after the following secondary operation was performed.

TECHNIC OF SECONDARY OPERATION.

Make a lateral, longitudinal, curvilinear incision, the longitudinal part of the incision being placed

midway between the palmar digital nerve and artery, on a level with the flexor tendons and dorsal artery. The curved part of the incision is directed toward the volar surface. A flap of skin and subcutaneous tissue is raised and retracted to bring into view the sutured tendon; and if bound down by adhesions must be freed to leave the tendon surface smooth. In addition, the sutured segment must be the same size as the rest of the tendon.

When the wound has healed, inaugurate gentle, passive movement with long excursions and rest intervened. Note that the stitch described above avoids postoperative separation of the tendon ends, is easy and rapid of accomplishment, and by burying the sutures between accurately approximated tendon ends, a smooth surface is obtained, avoiding adhesions at a point where a knot on the surface would encourage them (Fig. 27).

The literature affords scant information in the field of tendon suture, yet it is most interesting, pregnant with disappointment when poorly done; but, properly done, marks a step forward in modern surgery.

101 EAST EIGHTY-FIRST STREET

Metastatic Infectious Vertebral Arthritis from Foci in Tonsil and Left Antrum of Highmore

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CASE.—C. L., male, aged twenty-nine years, married; family history negative; previous history negative. The present illness began about September, 1920, the patient complaining of pain over the top of the head, constant, dull in character, and lasting for two weeks, after which the patient awoke one morning with a rigid neck. He was unable to rotate his head but was able to flex and extend it. The condition remained this way for about three months, during which time it was treated as a cold. About six weeks later the patient complained of severe pain on flexing and extending the head, in addition to pain on rotation. The pain soon became unbearable and constant, even when the slightest attempt was made to move the head. He was unable to sleep because of pain on placing his head on the pillows, so that he had to doze off at night in a sitting posture. A week later the patient had such severe pain in the back of the neck that morphine had to be administered. At this period he came under my observation. I admitted him to the People's Hospital in my service.

The chief complaints were inability to rotate, flex or extend the head; severe pain in the back of the neck; headaches.

A physical examination of the throat revealed marked congestion of the entire mucous membrane of the pharynx; the uvula was double its normal size, and the pillars were also swollen. The tonsils were of the chronic hyperplastic variety

and also showed signs of acute congestion, but no signs of an acute follicular tonsillitis. On slight pressure there was a free flow of pus from the crypts. An examination of the nose caused me to suspect disease involving the left antrum, as there was present a streak of pus as fine as a pencil line in the middle meatus. X ray plates showed involvement of the left antrum of Highmore; teeth negative; no evidences of bony involvement of the cervical spine.

LABORATORY AND PATHOLOGICAL FINDINGS.

Urine negative. Sputum negative for tubercle bacilli. Blood picture, white blood cells 14,000; polymorphonuclears eighty-one per cent.; lymphocytes, nineteen per cent. Blood pressure, systolic 130; diastolic 95. Some of the pus was expressed from the crypts of the tonsils and a culture made which showed the staphylococcus predominating. An autogenous vaccine was made. Blood culture was negative.

The following conditions were considered and ruled out: Torticollis, cervical Pott's disease, meningeal irritation, and gonococcic arthritis.

TREATMENT.

Antiseptic gargles were given to the patient with instructions to use constantly. The tonsils were removed under general anesthesia because the patient was unable to hold his head backward or even to open the mouth widely. A few days later

I irrigated the left antrum. This I have repeated several times and have made a permanent opening in the nasal wall of the left antrum. It was really surprising to note the marked changes which took place in the few days following the removal of the tonsils and treatment of the sinus. The temperature dropped from 102.8° to 99°, the patient looked brighter, and was able to move his head with some comfort. Each day was marked by some improvement and today the patient has free movement of the head.

CONCLUSIONS.

The purposes of presenting this case are as follows:

1. To mention an unusual case, that is, a vertebral arthritis complicating tonsils and antrum infection. The involvement of other joints is common, as are gastrointestinal symptoms and infections of various other organs. The condition apparently involved the joint of the atlas and axis,

since the patient was unable to rotate, flex, or extend the head.

2. To emphasize the importance of septic tonsils and the accessory sinuses as primary foci of systemic disease.

3. To show the gratifying results obtained when these foci are looked for, found, and eradicated, followed wherever possible by the employment of autogenous vaccines.

4. Foci should be looked for regardless of whether the patient gives a history of sore throats or any condition of the nose.

5. The involvement of the intervertebral joints took place through the lymphatics, since the secondary involvement was in close proximity to the primary focus, and since there was no involvement of other joints in the body and blood culture negative.

221 SECOND AVENUE.

Inflammatory Discharges from the Lower Female Genital Tract

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The term leucorrhœa has been loosely applied to any excess of secretion appearing upon the external female genitalia. This has generally been considered as a normal process or condition by the laity and one prone to occur at different periods in a woman's life. It is only when the character of the secretion becomes purulent, and irritation of the genital tract occurs, that sufficient notice is taken to cause the patient to seek medical advice. This entails, on the part of the gynecologist, the necessity of giving intelligent aid based on a consideration of the anatomy of the female genital tract and a consideration of all the possible sources of infection which are prone to occur.

The anatomical structures in the female where inflammatory conditions may occur, are the urethra—including Skene's glands—and the urethral tubular glands, the vestibule, vulva, Bartholin glands, vagina, cervix and cervical canal. The etiological factors are, first, a lowered vitality; second, the invasion of the tissues by pyogenic bacteria, either through the general circulation from some distant point in the body or their direct implantation locally.

ETIOLOGY.

Simple inflammation of the lower genital tract may occur in the course of the various infectious diseases and also from focal infections of the tonsils, sinuses, and teeth. In this latter case the cervical canal is usually involved. Simpler forms of infection with a slight discharge may be due to herpetic eruptions, infected urine from a cystitis, or a pyelitis, or even to a glycosuria. Occasionally thrush may involve the external genitals as part of a general gastrointestinal infection. More rarely diphtheritic infection occurs on the genitalia with

the formation of a membrane upon the vulva and in the vagina.

Perhaps one of the most common sources of simple inflammatory infection of the endocervix is that due to traumatism to the cervix during labor. Lacerations of varying depths may occur during both normal and instrumental delivery and, when this takes place, the soft and succulent tissues become a primary focus for the entrance of bacteria and they are rapidly cultured in this area. The infection can be either mild or severe. In the former grade there may be no constitutional symptoms but following complete involution of the structures there remains an enlarged softened cervix with a gaping os and an inflammatory erosion. Scar tissue is also present, distorting the contour and promoting an increase in the mucopurulent discharge which is now constant and persists with all the symptoms of pelvic discomfort. In the more severe form following the infection there is likely to be an extension of the process into the parametrical and the intrapelvic organs with evidence of a post-partum fever.

Gonorrhœal infections constitute most of the acute inflammation of the adult female. In this process all of the anatomical structures of the lower genital tract may be involved with the possible exception of the vagina, although this organ is not immune to gonorrhœal invasion. The organs which show a strong predilection for this infection are the urethra, including Skene's glands, the urethral tubular glands, Bartholin's duct and glands, and the cervical canal. In practically every patient with gonorrhœa both the urethra and endocervix are affected. Which one has been primarily involved is a question of much consideration.

A patient presents herself for treatment during the acute stage of the disease, giving a history of exposure, one to three days before the onset. There is frequency of micturition, with a burning or scalding of the external genitalia, and a general sense of fullness of the latter. On examination the vulva is found to be highly inflamed, in certain cases edematous, and a purulent discharge is usually present. If the labia are separated the external meatus is found to be inflamed and edematous and, usually, a profuse discharge can be noted about the lips. A finger inserted into the vagina and drawn along the course of the urethra discloses extreme sensitiveness and thickening of the periurethral tissue and pus can usually be expressed from the external meatus.

For the proper examination of the vagina and cervix, a speculum is necessary. The vagina as a rule is not involved in the acute inflammatory process. However, in those past middle life and in young adults and during pregnancy, these parts may become infected. Exposure of the cervix by means of the speculum shows it reddened and inflamed at the external os with a purulent tenacious material exuding from it or clinging to it. During this acute stage there are usually constitutional symptoms of varying degrees, chilly sensations, general malaise, and fever may be present. In still other cases the Bartholin ducts may become involved and the glands inflamed and go on to supuration.

TREATMENT OF GONORRHEAL INFECTIONS.

The treatment of this acute stage may be summed up as follows: Rest in bed, hot hip baths, and irrigation of the vulva with warm boric acid solution. Local treatment should not be undertaken at this period. For the painful urinary symptom alkaline diuretics are given and it may be necessary in certain cases to administer some form of opiate. When these acute symptoms subside, and this usually takes place within a week, local treatment may begin. Applications of argyrol, beginning with five per cent. and increasing to twenty-five, are made with a cotton swab to the urethra just within the meatus. If the whole urethral canal is infected and there is trigonitis as well, the urethra may be irrigated by instilling an ounce of a five to ten per cent. solution of argyrol or a weak solution of protargol, not above one half of one per cent. This should be done several times weekly, preferably daily. Vaginal antiseptic douches may now be given twice daily; potassium permanganate one in four thousand is extremely efficacious.

TREATMENT OF ENDOCERVICITIS.

This condition is treated in a like manner, but the details are extremely important. A speculum is inserted; the external os is exposed and applications of argyrol are made to the endocervix, care being taken that the applicator does not extend beyond the internal os. This is followed by tampons of glycerine and argyrol inserted into the vagina in contact with the cervix. In children and virgin adults the cervix can readily be treated by having the patient assume the knee chest posture; then a small Kelly cylindrical speculum can be introduced

without rupturing the hymen. Through this speculum the cervix is exposed and applications can be readily made to the cervical canal. Hot alkaline douches should be given twice a day. This treatment continues until the discharge has ceased and three successive smears have proved negative.

If the case continues to be a chronic one after six or seven weeks' treatment, and a vaginal discharge persists, in order to be certain that an infection of the urethra has not been overlooked, it is quite necessary to investigate it thoroughly by means of the tubular endoscope. The ducts of the deeply seated urethral glands may be found to be reddened.

Through the endoscope direct applications of argyrol or weak silver nitrate can be made to them. At times the tubular glands are so deeply infected and infiltrated that they can be felt on the anterior vaginal wall by the palpating finger. Under these circumstances it is best to use a dilating sound in order to express the inflammatory products from these glands and follow up the treatment immediately with argyrol instillation.

Rarely these glands suppurate, producing a sub-urethral abscess. Skene's glands frequently harbor the gonococcus and will continue a chronic discharge and also produce distressing urinary symptoms. The lips of the external meatus should be separated and Skene's glands can be treated in the same manner as the tubular glands. If the infection persists it may be necessary to lay them wide open upon a probe in order to insure proper drainage.

If the Bartholin ducts continue reddened and the gland secretes mucopurulent material, these glands may be injected through their duct with either silver nitrate or argyrol solution. The Bartholin glands may also suppurate, in which event incision and drainage should be undertaken. If the endocervix continues to be the seat of infection, silver nitrate may also be used in strengths from ten to thirty per cent. Some of the newer antiseptics, mercurochrome and acriflavine one half to one per cent., have also been used with very good results. Applications are made to the canal with a small cervical tampon.

However, it might be said now that in a chronic case of endocervicitis that has resisted treatment longer than three months, it may be necessary to use more drastic measures. Hunner, of Baltimore, applies the actual cautery to the endocervix in a linear manner. This destroys most of the epithelium and glandular structures, but later the formation of scar tissue may produce distortion and partial atresia of the cervical canal. Kelly uses the pure silver nitrate stick, which has the same object as the cautery. Fulguration has also been used with the same result.

Quite recently the application of radium has been used with marked success. A series of cases was reported by Curtis, of Chicago, in which radium was used where ordinarily it would have been necessary to operate in order to obtain a cure. At the Post-Graduate Hospital on the service of Dr. H. D. Furniss radium has been used for this condition. This applies to any form of chronic endocervicitis whether of a chronic gonorrhoeal nature, or due to

infection from the traumatism of childbirth, the dosage being twenty-five mg. of screened radium inserted in the cervix for three hours.

When a patient, suffering from chronic endocervicitis, the result of either gonorrhoeal infection or traumatism and infection at childbirth, has undergone a prolonged conservative line of treatment without cure, surgical measures are indicated.

The Sturmdorf operation, or a modification, should then be performed. This operation excises the infected mucous membrane of the canal, then by inverting a flap of cervical tissue, relines the canal as far as the internal os. When this operative procedure is done in a thorough and precise manner, a cure can practically be guaranteed.

47 WEST FIFTIETH STREET.

Clinical Studies of Lethargic Encephalitis^{*}

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Assistant Visiting Physician to the Episcopal Hospital, Chief of the Medical Dispensary at the University Settlement House.

When we first heard of lethargic encephalitis, associating and connecting it with the influenza epidemic, our impression was that we were dealing with a new disease. This proved, however, to be erroneous, for as a matter of fact Camerarius mentioned it under its present popular name of sleeping sickness in connection with his description of an influenza epidemic in Tübingen in 1718. Although the definite relationship between encephalitis lethargica and epidemic influenza is still an open question, in favor of those upholding the opinion that the disease is distinctly related to influenza is the fact, which is undoubtedly most suggestive, that it has appeared in epidemic form only when influenza has been epidemic. The opponents of that view point to the fact that in less than fifty per cent. of the cases reported in the literature is there a history of influenza.

BACTERIOLOGY.

As yet there has been no positive identification of the causative organism, that term being used advisedly and meaning to establish a bacillus isolated and recognized by other workers. Most encouraging, however, is the recent work of Levaditi and Harvier, who made intracerebral injection of emulsions of brain from patients dead from lethargic encephalitis and thereby produced lesions in rabbits similar to those seen in man and then a later transference of the disease to both guineapigs and monkeys. Further important information brought out by them is the fact that the virus in emulsions of rabbit brain tissue would pass through Chamberland filters Nos. 1 and 3. Inasmuch as four of the six rabbits injected with the filtrate contracted the disease, while all six controls became sick, it appears that filtration in some way reduces the activity of the virus. An equally important addition to our knowledge is the result of the work of Loewe and Strauss in their reports that Berkefeld filtrates of brain material, nasopharyngeal mucous membrane and nasal washings from cases of epidemic encephalitis have produced in rabbits and monkeys lesions typical of this disease. Spinal fluid and blood have also pro-

duced the disease experimentally in these animals. The virus has been passed through many series of animals.

Suggestive at least is the laboratory conclusion here reached, viz., that this disease is transmitted by secretions of the nasopharynx and that mild and abortive cases and carriers play an important part, when it corroborates the clinical findings of William Boyd (1) in an epidemic of the disease in Winnipeg, Manitoba.

PATHOLOGY.

The most striking thing about the brain of a patient who has died from lethargic encephalitis is the marked degree of congestion and edema which may be either local or general. Although in some cases the entire cerebrum was involved, the brain stem was most frequently affected. Small pin point hemorrhages were frequently seen in the medulla while sections showed a perivascular round cell infiltration. This latter was noted most often near the fissure of Sylvius and the floor of the fourth ventricle extending into the cord and sometimes into the basal ganglia. Grossly, many brains show nothing pathological, yet these same brains show microscopically a round cell infiltration.

SYMPTOMATOLOGY.

The polymorphism of this disease gives us a wide and varied symptomatology. This has resulted in the appearance in the literature of many classifications, broad, comprehensive and inclusive, especially that of Roger, yet not as practicable for the internist as that of MacNulty, which is as follows:

1. Cases with general symptoms and without localizing signs.
2. Cases with third nerve paralysis and general disturbance in the function of the central nervous system.
3. Cases with facial paralysis and general disturbance in the function of the central nervous system.
4. Cases with spinal manifestations and general disturbance in the function of the central nervous system.
5. Cases with polyneuritic manifestations and

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general disturbance in the function of the central nervous system.

6. Cases with mild or transient manifestations (so-called abortive cases).

The symptoms are both general and localizing, the former including lethargy, fever, headache, body pains and coated tongue, while the latter are referable to the cranial nerve or nerves involved. To my mind the outstanding symptoms are lethargy and a negative spinal fluid. In cases where the third or sixth nerve nuclei are involved of course ocular symptoms are prominent. A diagnosis is not easy and in order to make it we must make use of every means at our command, viz., careful history and physical examination and thorough laboratory tests done by a well trained competent technician.

It has been my fortune to study the cases reported herewith and I have been enabled to state the present condition of the living patients through the cooperation of the Social Service Department of the Episcopal Hospital.

CASE I.—J. G., aged forty-five, was admitted to the Episcopal Hospital April 15, 1920. The family history was negative. His previous medical history was negative until two months before admission, when a cough started, accompanied by a slight mucoid expectoration and a loss of weight and strength. During that time he also felt indisposed for his work as grocer and was rather tired and sleepy. About four weeks before admission to the hospital the weariness and sleepiness increased and two weeks later he was unable to continue with his work but went to bed complaining of exhaustion. Following this his wife noticed that he began acting queerly and talking in a rather peculiar way. He refused to remain in bed, became most irrational at night, sleeping very little, and finally the day before admission he went into a restless, muttering delirium. Examination on admission showed a rather anemic man with masked facies and a toxic appearance. He was restless and refused to stay in bed, had slight difficulty in speech, talked incoherently to himself, though he would answer questions intelligently, drifting back into mental confusion.

The positive physical findings were as follows: Pupils contracted and reacted sluggishly to light; marked tremor of the tongue; general muscular hypertonia, especially of the neck, but no actual rigidity; abdominal reflexes normal but patellar exaggerated; a positive Kernig's sign on both sides.

The laboratory findings were: Urine: specific gravity, 1020; albumin, cloud; sugar, negative; light and dark granular casts; no red blood corpuscles; occasional white blood corpuscles. Blood: hemoglobin, sixty-five per cent.; red blood corpuscles, 4,300,000; white blood corpuscles, 11,600; differential polynuclears, sixty-two per cent.; mononuclears, twelve per cent.; small mononuclears, twenty-four per cent.; basophiles, two per cent. Wassermann, positive three plus. Spinal fluid, not under pressure, clear; ninety-one cells to the c.mm.; polynuclears, ninety; lymphocytes, ten; Fehling's reduced; globulin, negative.

After three days, from a condition of restless muttering delirium (in which restraint was neces-

sary) he lapsed into a deep coma. He lay with mouth open, eyes closed and face immobilized and did not respond to questions. During the three days he ran a hectic temperature ranging from 97° to 103° (rectal). He took liquids well and his excretory functions were normal. During the next three days he became steadily worse, ptosis of both eyelids developed, with paralysis of the soft palate, and dropping of the lower jaw, and finally death occurred at 5 a. m. April 21st.

REMARKS.

The interesting features in this case are the absence of any apparent influenzal infection, aside from slight bronchial irritation, the absence of the more usual initial symptoms, such as diplopia and ptosis, and finally the severe maniacal development which ensued. The prodromal period may be regarded as having existed possibly for a period of two months. Fever may or may not have been present during the prodromal period but while the patient was in the hospital he ran a hectic temperature, ranging from 96.4° to 106°, the latter being terminal. The presence of a Kernig's sign is of particular interest in that it is usually described as being lacking in this condition. We must also note the rather high cell count in the spinal fluid, although it is by no means uncommon to find a count as high as this.

CASE II.—C. F., aged forty-three, was admitted to the Episcopal Hospital, April 16, 1920. The family history was negative. The personal history was negative until four weeks before admission when he had influenza: this was followed by rhinitis and pain in the frontal sinus and in the left ear. These cleared up in a few days and he felt well until the beginning of the present illness, which began one week before admission, with pain in the left shoulder, the muscles of the chest, and in the gastric region. Three days later he manifested tremors of both hands and twitching of the abdominal and lower intercostal muscles, associated with shooting pains over the same region. These muscular contractions and pains prevented his sleeping for the three nights previous to admission.

Examination on admission showed a masked expression but no visual disturbances or palsies; slight tremor of both hands; heart and lungs negative; abdomen distended and the upper recti muscles slightly rigid; some tenderness to pressure over the epigastrium. There was also a constant clonic contraction of the upper abdominal muscles, the lower intercostals, and apparently the diaphragm. He had considerable belching but no hiccough, nausea or vomiting. Abdominal and patellar reflexes were slightly exaggerated. Mental condition was lucid.

The laboratory findings were: Urine: specific gravity, 1012; albumin, very faint trace; sugar, negative; no casts, red blood corpuscles or white blood corpuscles; many motile bacteria. Blood, white blood corpuscles 16,000; Wassermann, negative.

PATIENT'S CONDITION WHILE IN HOSPITAL.

He talked a great deal during the night, got out of bed, and seemed confused when put back. During the following five days he was irrational at times, had delusions and hallucinations and slept but little.

The abdominal twitching was constant. His temperature ranged from 100° to 103°. From this state of delirium in which restraint was necessary he became lethargic; however, he could be aroused and answered questions rationally. At the end of five days more, although he slept a great deal, there was marked improvement; his expression became more natural and for the first time the abdominal twitchings were absent. He complained of a tingling and numbness of the skin and shooting pains in the chest and abdomen. These gradually disappeared, as did all tremors, but lethargy was marked for a week following, during which time the patient often fell asleep while sitting up.

REMARKS.

This case clearly followed an influenzal infection of recent origin. The patient's symptoms were ushered in by pain in the shoulders, chest and gastric region, and tremors of the hands and abdominal muscles; hence he falls more within the polyneuritic classification, though the pronounced maniacal tendency rather precludes a clearcut classification. His most constant symptom was the spasmodic contractions of the muscles of the upper abdomen, a symptom regarded by some as pathognomonic of lethargic encephalitis.

In spite of repeated requests this man did not return to the hospital for an examination by me. The social service reports that he is working but not at his old occupation. Since discharge from the hospital he has been under the care of a doctor and is much improved.

CASE III.—S. B., male, aged fifty-two, was admitted to the Episcopal Hospital on April 14, 1920. His family history was negative. The personal history revealed the fact that for about two months before admission he suffered markedly from nervousness which he felt was due to the strain of his work in the fuel oil plant at the Navy Yard; he also had gaseous eructations and epigastric pain. In addition he had pains in the muscles of the legs, with tingling and numbness. On admission to the hospital, the patient showed a continuation of the above mentioned symptoms, plus diplopia. Tremor of the legs became persistent and violent and he was unable to sleep.

Examination showed an extremely restless and nervous man, who had slight difficulty in speech, which was stuttering and scanning. The facies was masked. There was a suggestive bilateral ptosis of eyelids: the pupils were contracted and equal, responding but slightly to light and accommodation. The tongue was tremulous and deviated toward the right. There was no abnormality of either the heart or lungs. There was muscular resistance of the abdomen and the reflexes were present and a tache noted. The tremors of the legs were convulsive; the patellar reflexes could not be elicited at this time. Ankle clonus was marked on the right side; the Babinski reflex was negative while Kernig's sign was suggestive. There were marked tremors in both hands.

Laboratory findings were: Urine: specific gravity, 1012; albumin, trace; sugar, negative. Occasional granular and hyaline cast; few red blood corpuscles; few white blood corpuscles. Blood: hemo-

globin, seventy per cent.; leucocytes varied between 11,000 and 14,000. The differential count was normal with polymorphonuclears predominating. Wassermann test was negative. Spinal fluid, under pressure: clear; forty-five cells to the c. mm.; Fehling's solution was reduced; globulin was negative; no organisms were found on the smear.

PATIENT'S CONDITION WHILE IN HOSPITAL.

He went almost immediately into a muttering delirium and became somewhat resistive, rendering restraint necessary. He slept some but muttered almost constantly. After three days of restless delirium, during which time his temperature rose from 101° to 104°, he went into a profound lethargic state and could be aroused only with difficulty. The tremors disappeared at this time but the patellar reflexes were present. Marked bilateral ptosis, difficulty in speech, masked facies and lethargy were most pronounced at this time. During the following ten days there was a gradual decline in temperature from 104° to normal, accompanied by a slight improvement in both mental and general condition. He slept quietly most of the time but occasionally got out of bed and seemed disoriented. All of his symptoms slowly disappeared and he was discharged much improved late in July. The classification of this case is a difficult one but should lie between the polyneuritic and psychotic type.

CONDITION OF PATIENT ONE YEAR LATER.

He returned to work in September, 1920; his position required great accuracy and mathematics. At first he was a little shaky, a sensation which he experienced for about three months. He was still very nervous and had difficulty in getting to sleep: it usually took about three hours. He had no mental depression nor any difficulty in concentrating. There had been no eye symptoms and very few headaches; nor had he suffered from any abdominal pains. He looked well and had gained fifty pounds. His eyes reacted normally to light and accommodation; his knee jerks were normal. There was a slight tremor of the right hand and a very slight ataxia.

CASE IV.—W. T., male, aged thirty-two, was admitted to the Episcopal Hospital, April 6, 1920. His family history was negative. His personal history was also negative until two months before admission, when he had an attack of influenza which confined him to bed for one week. Following this he had a frontal sinus infection which cleared up in a few days.

Present illness began three weeks before admission when, after feeling unusually well, he awoke one morning with diplopia. This continued for one week when he consulted an eye specialist who dilated and refracted the eyes: the diplopia continued, however, and a purulent conjunctivitis developed. One week before admission he went to bed, complaining of his eyes and of being drowsy. Four days before admission he began having difficulty in articulation, which has increased until he could not speak. The day before admission he had difficulty in swallowing. Physical examination showed an expressionless face with tremor of the muscles around the mouth. The pupils were dilated and did not react to light: there was a bilateral ptosis and a

catarrhal conjunctivitis. The tongue was protruded with difficulty and was tremulous and coated. There was resistance in the muscles of the neck but no rigidity. He could not talk, although it was evident he understood what was said to him as he endeavored to do what he was told. Heart, lungs and abdomen were negative. Patellar reflexes were exaggerated: there was no Babinski or ankle clonus: Kernig's sign was suggestive. A general muscular hyper-tonicity was noted.

Laboratory findings were: Urine: specific gravity, 1017; albumin, negative; sugar, negative; no casts, no red blood corpuscles. Blood: hemoglobin, eighty per cent.; red blood corpuscles, 4,150,000; white blood corpuscles, 9,400; differential, normal. Wassermann, negative. Spinal fluid, not under pressure; twenty-three cells to the c. mm.; Fehling's reduced; globulin, negative. Eye examination: Slight edema of the retina; slight swelling of the fundus; vessels engorged.

PATIENT'S CONDITION WHILE IN HOSPITAL.

He swallowed liquids fairly well. The facies remained masked and the muscular resistance general: the twitching of the mouth muscles was present continuously. At the end of the first week the conjunctivitis had cleared up, he began to talk slowly, and showed general improvement. At the end of three weeks he could articulate distinctly and felt well, although the tremors were still persistent. The day following this report of his condition at the end of three weeks he had a prolonged visit from some of his friends and his difficulty in speech and swallowing became very marked: furthermore he stared at one object constantly with his eyes wide open. He reacted slowly to any stimulus: he did, however, complain of a tingling and numbness of the third and fourth fingers of each hand, his sleep was disturbed by dreams and for the first time he became solicitous about his condition. At the end of a few days he showed a general improvement, though there was a slight paralysis of the left facial nerve. Although lethargic in appearance, he slept but little. His condition continued to improve slowly and he insisted upon leaving the hospital late in May.

REMARKS.

This case was typical of the many reported in the literature and offered no difficulty whatever from the viewpoint of diagnosis. Report of present condition shows that he feels well except for weakness in both feet and legs: he also tires easily. He has trouble getting to sleep and often awakens during the night. At times he becomes confused, especially by excitement: he is much slower to form ideas than formerly. His wife states that his disposition has changed very much and he is solicitous about his condition. He feels a little stiffness in the muscles of his neck and there is a slight weakness of the muscles of the left side of his face. He has been doing clerical work since October 1, 1920. His patellar reflexes are exaggerated on both sides. His left pupil reacts slightly more promptly than the right. There is no ataxia.

CASE V.—C. L., male, aged twenty-two, was admitted to the Episcopal Hospital, April 30, 1920. His family history was negative. Personal history

showed that twelve weeks previous to admission he had a severe attack of influenza followed by double pneumonia and pains of a rheumatic character in the shoulders and legs. He was confined to bed for eight weeks. During his convalescence in the two following weeks he suffered from a severe cough with slight expectoration. During this time he complained of weakness, exhaustion and dizziness and slept a great deal, mentioning in addition the pains in his shoulders and legs. Two weeks before admission he returned to his work of driving a milk wagon and at the time complained of being sleepy and unable to wake up in spite of sleeping thirteen hours a day. During this period he seemed rather irritable and his speech was unnatural. The present illness began four days ago. While driving his milk wagon he suddenly lost the power of speech, complained of diplopia, and inability to change money correctly. He drove back to his home where he collapsed and thought he had a stroke. His expression was unnatural and he had general tremors, which were most pronounced in the legs. Immediately following this he was unable to move his left side and his speech did not return.

Physical examination showed a well developed man with a masked expression, markedly jaundiced, and unable to talk or move the left arm or leg. His eyes reacted normally to light and accommodation; there was no nystagmus or ocular palsies; the sclera were slightly icteric. The mouth was pulled to the right and he was unable to move the facial muscles of the left side or wrinkle his forehead. There was a slight tremor of the tongue. As was the case with W. T., it was evident that he understood what was said to him as he endeavored to do what he was told. The neck showed a slight muscular resistance. The chest was negative except for a few moist râles at the base of the right lung. The heart showed forcible pulsation against the chest wall, a precordial thrill and a blowing systolic murmur heard most distinctly over the pulmonic area. The first sound was loud and roughened: the quality was poor and varied a great deal over the different areas, and there was marked arrhythmia. The abdomen was markedly jaundiced and there was slight tenderness over the gallbladder region together with a muscular resistance of the upper abdomen. The reflexes on the right side were normal; a tache was obtained. The patellar reflexes were present and exaggerated on the left side where the Babinski was present; Kernig's sign was suggestive on both sides; there was a flaccid paralysis of the left arm and leg.

The laboratory findings were: Urine: specific gravity, 1014; albumin, slight cloud; sugar, negative; many granular casts; few red blood corpuscles; few white blood corpuscles. Blood: white blood corpuscles, 14,800; Wassermann, negative. Spinal fluid, not under pressure; twenty-six cells to the c. mm.; does not reduce Fehling's; globulin, negative.

PATIENT'S CONDITION WHILE IN HOSPITAL.

During the first week he began to articulate fairly well, speaking short sentences. The facial paralysis of the left side naturally changed but little. His appetite was good and he slept quite normally. His temperature dropped to 98.3° and his mental condition was clear. The jaundice began to clear up rapidly

and he complained of but few epigastric pains. By the end of the following ten days power in his left hand began to be shown and there was fairly good motion in his left leg. The jaundice also cleared up and his condition was highly satisfactory. He was discharged on the first of June as improved.

PATIENT'S CONDITION ONE YEAR LATER.

This patient disregarded my request to present himself for examination; however, the Social Service Department learned that he had had treatment at the Nervous Dispensary at the University Hospital so that from the notes at the time of his last visit, which was late in March, I am able to give the following report: He had a distinct amnesic aphasia, evidently an aftermath of his lethargic encephalitis. He could understand all spoken phrases fairly well but complicated or difficult ones seemed to confuse him. He had no word blindness or word deafness and no signs of a hemiplegia. He had no hemianopsia. The patellar reflexes were exaggerated: the eyes reacted normally to light and accommodation.

CASE VI.—T. B., aged thirty-four, an Italian, was admitted to the Episcopal Hospital, May 10, 1920. His family history was negative. His personal history was also negative until March 10, 1920, when he had an attack of influenza which confined him to bed for about two weeks. Following this attack he had a pain in the right ear and over the right eye, which passed off in a few days although the hearing in his right ear had been impaired ever since. He felt well then until two weeks previous to admission. His present history began at that time with a feeling of illness but no definite complaint, simply a malaise and anorexia. In a few days he began having twitching of the muscles of the right side of his neck, which became associated with sharp pains in the neck and shoulders, extending down the right arm. The pain and the constant muscular twitching kept him awake at night. Six days before admission he began to have tremors of both hands and a diplopia which lasted two days. Then he noticed difficulty in articulation. At the time of his admission he complained most of the twitching of the muscles of the neck, pain in the neck and right arm, and inability to sleep.

The physical examination showed a masked facial expression with head retracted backward and slightly to the right side. The pupils were dilated but responded to both light and accommodation. There was a marked tendency to stare. In the right ear was noted a slight impairment of hearing. The tongue was not tremulous. The neck showed constant convulsive twitching of the trapezius muscle most marked in the cleidooccipitalis portion. There was the painful sensation of an ordinary neuritis confined to the nape of the neck, shoulder and right arm and hand. Marked muscular resistance of neck was noted. The heart, lungs and abdomen were negative. The patellar reflexes were increased; Kernig's sign was absent; there was no ankle clonus and no Babinski.

The laboratory findings were: Blood: hemoglobin, seventy-five per cent.; red blood corpuscles, 5,890,000; white blood corpuscles, 8,200; differential showed polymorphonuclears 72; lymphocytes 28. Wassermann, negative. Urine, albumin, negative;

sugar, negative; no red blood corpuscles; no casts. Spinal fluid: Twenty-one cells to the c. m.; not under pressure; Fehling's reduced; globulin, negative; Wassermann, negative.

PATIENT'S CONDITION WHILE IN HOSPITAL.

He ran a normal temperature and his mental condition was clear. For the first week the masked expression became more marked as did the tendency to stare: furthermore, he developed a partial ptosis of both lids. The twitching of the right trapezius remained constant and was at the rate of sixty times a minute; a marked quivering of the muscles of the arms and tremors of the hands were noted. He responded to questions very slowly and articulated with great difficulty. He slept but little. He improved slowly but satisfactorily but his relatives insisted on taking him home on the first of June, some time before it was advisable.

PATIENT'S CONDITION ONE YEAR LATER.

There was a marked shakiness but no disturbance in the region of neck or trapezius muscle. The tremor of the tongue was very noticeable. He complained of a continuous headache in the frontal region, had troubled sleep and was depressed about himself. He had worked part time for the past few months but was under a doctor's care for two months after he left the hospital. He had gained considerable weight. The pupils were equal and reacted promptly to both light and accommodation. There was a slight ataxia but no ankle clonus or Babinski. The patellar reflexes were exaggerated.

DIFFERENTIAL DIAGNOSIS.

In considering the differential diagnosis of lethargic encephalitis we must consider, first, syphilitic meningitis, where the positive findings are fluid under pressure, positive Wassermann, positive Kernig's sign, some rigidity of the muscles of the neck and a patient in a continuous stupor and who when roused cannot comprehend what is said to him; second, tuberculous meningitis where there is also fluid under pressure and it contains many lymphocytes and tubercle bacilli, positive Kernig's, some rigidity of the muscles of the neck, the tuberculous history and physical findings and the dissociation between the temperature and pulse; third, anterior poliomyelitis in which the spinal fluid is cloudy, contains many polymorphonuclear and eosinophilic leucocytes and the meningococcus, positive Kernig's, stiffness of the muscles of the neck, exaggerated patellar reflexes, positive Babinski and ankle clonus; fourth, cerebral abscess in which the eye examination showed choked disc, the leucocyte count is high, there is a marked pleocyte count and at times cloudy spinal fluid, hectic temperature, usual history of primary focus and projectile vomiting; fifth, brain tumor in which there is usually a history of slow onset with headache and vomiting.

TREATMENT.

The treatment of lethargic encephalitis is entirely symptomatic, as must necessarily be the case in the present state of our knowledge. Absolute quiet, light nourishing food given at frequent intervals, good nursing and hydrotherapy are fundamentals. Lumbar puncture as a therapeutic measure in cases where the meningeal symptoms are marked is very

effective. Urotropin in ten grain doses three times daily has been advised but the results do not appear to justify its use.

CONCLUSIONS.

1. The protean character of the symptoms of lethargic encephalitis makes the diagnosis in the atypical cases very difficult.

2. Laboratory and clinical findings make it evident that mild and abortive cases and carriers play an important part in its spread, especially during an epidemic.

3. The four most prominent symptoms are eye conditions, lethargy, fever, and atypical spinal fluid.

4. The filterable virus has a selective action on the brain stem.

5. Definite symptoms of cerebral disturbance are seen in patients one year after the disease.

In conclusion I wish to express my gratitude to Dr. Arthur H. Hopkins and Dr. John Eiman for their assistance in the preparation of this paper.

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Rheumatism and Allied Affections

By ALBERT C. GEYSER, M. D.,
New York.

To write about rheumatism nowadays requires more or less temerity. Rheumatism is a term used to cover a mass of medical ignorance. There is a really scientific side to this disease but in this article I shall ignore this and confine myself to the practical end results. Science informs us, that beside the *Bacillus rheumaticus* there are no less than a score of other bacilli thoroughly capable of producing all of the usual signs and clinical manifestations of a typical case of this disease. As a matter of fact, we do not require the assistance of any germs at all. Faulty metabolism, and especially, suboxidation and the nonelimination of nitrogenous compounds are sufficient to cause this disease through autotoxemia.

There is one point upon which there is a perfect unanimity of opinion, that without a toxin in the system, there can be no rheumatism. Various toxins have various tissue combining qualities. The toxin of diphtheria shows a predilection for the cardia, that of poliomyelitis for the anterior cornua, late stages of syphilis for the posterior columns, phosphorus for the lower jaw, lead for the extensors of wrist and foot, shellfish for the skin in urticaria, and many other examples could be given. When such a toxin shows a predilection for the fibrous tissue of the body, we may have any form of rheumatism from cardiovalvular lesions to asthma. If the toxin prefers a combination with muscle tissue we may have anything from myocarditis to so-called inflammatory muscular rheumatism.

Some of these toxins seem to have a predilection for the bony tissues, giving us the entire gamut from osteitis to chronic arthritis deformans. Frequently these tissue combinations take place between the toxin and the nervous system, then we call it neuralgia or neuritis. But in whatever form or anatomical location these pains occur, they are always the result of an excess of something in the system. No one ever heard of a starving or underfed individual complaining of rheumatism. In fact every one knows that total abstinence from food is one of the quickest, while not the most convenient, form of a rheumatic cure. Such causes as expo-

sure to cold or dampness are always incidental. The systemic condition, plus the presence of the toxin, is all that is needed. There is a sudden dulling of one part of the body and at once the toxin finds a tissue with a temporary lowered resistance. This toxin and tissue combination, for the want of a better name, we call a case of localized rheumatism. The most frequent form of this type is a brachial neuralgia. It occurs more often on the right side, because most persons are right handed. The right arm and shoulder perform more labor, hence require more tissue food. If the right arm or shoulder is exposed to a sudden draft and dulling has taken place, the local tissue metabolism is interfered with, and toxins, from some source or other usually being present, a combination occurs, and the result is a brachial neuralgia-rheumatism. A similar condition may occur under other circumstances and in other parts of the body. Exposure to cold or damp, trauma, overfatigue, and physical or mental exhaustion are all means to the same end. In all of these cases a toxin must be present.

FINDING THE CAUSE OF THE TOXIN

Since it is admitted that the toxin plays the most important rôle in the production of rheumatism, it follows that unless we locate and remove this toxin we cannot find a cure. Such toxins usually originate in some focal infection. Perhaps the most common focal infection is found in one or more root abscesses of the teeth. A great deal has been written concerning pyorrhœa alveolaris.

I take this opportunity of correcting an all too common error. In cases where the gums are infected so that the pus can be pressed out from around the teeth, we do not have rheumatism; on the other hand, a single tooth or old root with an abscess at the bottom can and usually does cause rheumatism anywhere in the body from the heart to the great toe. Why is this so? Simply because in one instance we have free drainage, with practically little or no absorption, while in the other there is a closed abscess, without drainage and with constant absorption. This does not mean that infected and loose teeth should be removed at once,

but it does mean that an x ray should be taken and if the root canals of dead teeth are improperly filled (and most of them are) they should be attended to; if the pyorrhea is marginal, the teeth should not be sacrificed, although they may be loose, without an earnest attempt at medication. They can frequently be made as firm and useful as they ever were. At any rate their extraction would have no influence on the course of the rheumatism.

THE TONSILS.

Not infrequently, the tonsils are the point of focal infection. A tonsil, which has once been diseased is always a source of danger. The mouths of the crypts are likely to become closed and the pus is absorbed instead of being discharged from the system. Should such tonsils be removed? My experience leads me to the following conclusion: If either one or both tonsils are so much enlarged as to interfere with deglutition or respiration, tonsillotomy or tonsillectomy is indicated. If such an emergency does not exist operative intervention is not warranted. A far better procedure is the use of the x ray. One properly regulated dose, applied at a two weeks' interval, will cause a shrinking after the fourth exposure. Such a tonsil undergoes a physiological involution. By its gradual contraction all the toxic material is forced out, the crypts are closed, and the tonsils are protected from infection in the future.

URETHRITIS.

In cases of urethritis veneria, the patient never complains of rheumatism as long as the urethritis is in the acute stage, with a copious discharge and free drainage. A few weeks or months after he has been "cured," when the germ has invaded the prostatic gland and there is no longer free and sufficient drainage, then the typical signs of the Neisser cocci rheumatism appear. These germs may then be found anywhere, but always where they cannot be discharged from the body.

Another patient may have an old sinus, which has been the bane of his existence, finally the sinus is closed. The patient is happy until a few weeks or months later, when there develops a most intense form of inflammatory rheumatism. In this case the fistula had a pyogenic membrane throughout its entire length, usually tortuous. The tract was not open and the entire pyogenic membrane was not removed, instead the mouth was sealed up, making toxin absorption possible; hence the development of the rheumatism later.

The focal infection may be anywhere. After a thorough physical examination, especially of the accessible orifices of the body, an electric spinal reflex examination should be made. Such an examination frequently throws light upon an otherwise obscure condition. When the particular organ has been pointed out, by a process of elimination, the underlying cause may be determined. I say "may be" because after all there is nothing so certain as the uncertainty of things. Such a process of examination may take a long time for completion. Must the patient suffer from rheumatism while we are hunting for the cause, which we may never find? Certainly not. The physician's first

duty is to relieve suffering, then, if possible, produce a cure.

TREATMENT.

We are fortunate in having at our disposal certain therapeutic measures which at least furnish relief from the pain of rheumatism. The salicylates have an established reputation. We may not know whether they act as a neutralizer for the toxins or whether they make the soil undesirable for the germs. At any rate the relief from pain is positive. Another series of drugs, with an equally deserving reputation, is the iodides. Nearly every anti-rheumatic combination is sure to contain either one or both of these drugs. They are a happy combination, because one acts quickly in assuring freedom from pain, while the other, acting more slowly, is the best internal oxidizing agent we possess. Neither of these drugs should be given by mouth, the one neutralizes the enzymotic action of the digestive function, the other oxidizes the food, thereby preventing its absorption. The two drugs must be used intravenously. The dose is fifteen grains of each in a sterile solution. In the ordinary case, this dose is repeated every other day. In extreme cases, where the rheumatic condition manifests itself by asthmatic attacks, I have used three such doses within twenty-four hours. It is seldom that more than six injections are required to insure freedom from all discomfort in acute cases. The New York Intravenous Laboratory has demonstrated by animal experimentation that the human economy bears large doses of these drugs with impunity.

As soon as the acute attack is under control it is well to subject the particular area to the diathermic phase of the high frequency current. By heating such tissues, not from without inward, but from within outward, there is produced a marked vessel dilatation. Heated blood, increased in amount, is forced through the parts, thereby increasing the local tissue metabolism. Nutrition is increased, effete material is removed, new chemical combinations are formed between the toxins and the drugs, producing freedom from pain in a normal physiological manner.

There is a third drug that seems indispensable in certain cases. When the patient is in a run down condition, the red cell count low, the hemoglobin below eighty per cent., he may be freed from the acute pain, but cannot pick up. The whole hematogenic power of the system is below par. The cacodylate of iron (arsenic and iron), given intravenously, is the indicated remedy. Although the arsenic and iron preparation is injected into the venous blood stream, the blood itself is not expected to make use of it. This drug exerts its influence solely upon the hematogenic system. An injection should be made two to three times a week for about two weeks, when the results will be apparent.

DIET.

The most important rôle of the diet in rheumatism is the reduced intake. The poorer the diet and the smaller the amount, the quicker and better the results. It is simply a question of increasing the oxidizing and eliminating power of the system.

HYGIENE.

For home treatment there is nothing better than copious perspiration. It matters little how this is accomplished. Each case must be governed by its own circumstances. A hot bath (105° F.), followed by a short cold bath (80° F.), taken just before retiring opens the sweat glands. Hot lemonade sipped during the bath or a cool drink after the bath, prolong the effect. The cold pack is effective in some cases.

If the weather permits, be sure to open the windows of the sleeping room, top and bottom. There is no danger of catching cold. Colds are not caught by sleeping with the windows open, but by living in overheated rooms containing too much human emanation and too little moisture.

The bowels must be kept open with a warm water and soap suds enema every twenty-four hours. It should be explained to the patient that he need not fear the douching habit. It is a good

habit. It does no more harm than daily mouth washings.

CONCLUSION.

1. The treatment of rheumatism resolves itself into finding and removing the focal infection.

2. Neutralizing the toxins and oxidizing useless waste material are accomplished by the intravenous administration of sodium iodide, and sodium salicylate. These injections may be repeated from three a day or as many during the week as conditions warrant.

3. Elimination is brought about by a reduced intake, by omitting all diets rich in proteins and nitrogen; by daily evacuations and by copious perspiration.

4. The affected tissues are fed by an increase in the local circulation, best accomplished by the application of diathermia.

140 WEST SEVENTY-FIFTH STREET.

Acute Yellow Atrophy of the Liver Complicating Acute Appendicitis*

By MOSES BEHREND, M. D.,
Philadelphia.

Acute yellow atrophy of the liver is a rare disease, many clinicians of large experience never having observed a case. Osler practised many years before he encountered this very fatal affection, and altogether four cases have come under my observation. The patients lived from a few hours to a week after they were first seen. One patient was brought to the Mt. Sinai Hospital in an unconscious condition a few months ago. She had had a cholecystectomy performed two years ago. I was urged to operate on her but refused because I had made a diagnosis of acute yellow atrophy of the liver, which was confirmed at autopsy. The remaining three cases including the one to be reported were observed in the Jewish Hospital. Two patients lived about a week.

The affection is not easy to diagnose but all the symptoms were practically alike in the cases observed. The symptoms come on rather stealthily. There is a slight gastrointestinal disturbance, soon followed by vomiting of a mild character. Malaise and the lack of desire to take food are noted, followed almost immediately by a slight jaundice, without pain, which is very characteristic. The jaundice differs from that due to obstruction of the bile passages on account of the absence of pain, and the less intense yellowish discoloration seen in the latter condition. Delirium finally ensues, which is a constant symptom and portends a fatal termination.

CASE I.—H. J., a young girl, sixteen years of age, admitted to the Jewish Hospital about February 23, 1921, referred by Dr. Johnson, of Cheltenham. The patient had been sick for two days, suffering from

all the cardinal symptoms of acute appendicitis. Tenderness was elicited in the right iliac fossa, no pain being present unless the abdomen was palpated. The disease was localized. She was given the Murphy drip, and nothing by mouth; operation was performed on the following day. On account of the presence of acute bronchitis chloroform anesthesia was used. It has been our custom in the past to employ nitrous oxide gas and oxygen in all chest conditions but on account of the danger of spreading infection at operation due to improper relaxation from the use of nitrous oxide and oxygen, chloroform was the anesthetic of choice. We found the appendix gangrenous and the pelvis contained pus. The abdomen was drained. For the first twenty-four hours the temperature ran a normal course. The following morning the skin was slightly jaundiced, there was a rise of temperature, the pulse was good though a little rapid. The patient vomited a little and during the day she became delirious, the temperature rose, the pulse weakened, and she died early on the morning of the third day. The diagnosis of acute yellow atrophy of the liver was confirmed at autopsy. It showed the liver pale yellow in color, not especially smaller in size. It resembled the liver of fatty degeneration, which was confirmed microscopically.

Two factors could have caused the fatal complication, namely, a late poisoning due to chloroform anesthesia or the serious appendiceal infection. It is impossible to come to a definite conclusion but the cause of the complication seems to point rather strongly to the anesthetic.

1427 NORTH BROAD STREET.

*Case reported before the Philadelphia Clinical Association, May 3, 1921.

The Prevention of Venereal Diseases

By JOSEPH BROADMAN, M. D.,
New York.

From various medical sources, increasingly frequent in occurrence, come assertions that physicians should be leaders in the movement of venereal disease prevention. Occasionally one even reads of threats, on the part of some farseeing and well-thinking colleague, that unless the members of the medical profession take up that leadership the public eventually will. Every one reading the literature realizes that the profession is fully cognizant of the danger to the nation from the world wide scourge, venereal disease. Likewise there is complete unanimity of opinion that the danger has markedly increased recently due to the war. But while all agree as to the dangers, the leaders of the profession, with but few exceptions, have so far hesitated to adopt, or to advise the adoption of, methods for the prevention of venereal diseases that will bring results.

We hear from all corners of the earth that the prevention of diseases of all kinds is purely a scientific matter, but somehow the ordinary methods employed in the prevention of those diseases are not usually applied to venereal diseases. Yet, why should a group of afflictions causing more suffering than is possible to estimate because of the terrific damage done—economically, morally and to the public health—be so slighted? Apparently the fact that the subject is a touchy one and might arouse much antagonism from certain quarters has a great deal of influence with a large number of the profession. Such antagonism is of slight importance when compared with the tremendous good that real preventive measures could do for the public in safeguarding it from those diseases. Attention is directed not only to results from youthful errors, with a long train of misfortune late in life, but also to the dangers that may befall the victims' wives, children, relatives and neighbors. No amount of excuses or difference of opinion can possibly overcome the fact that, while the grand discussion of "how to do it" goes on, many people are becoming victims of venereal diseases who might otherwise be protected from the calamity.

With these important points in mind I wrote an article recently (1) giving the moral as well as the medical phases of venereal prophylaxis. An earnest effort was made to give the moral side of the question full recognition. So it was asserted that sexual intercourse in healthy marriage alone is the only safe preventive, and that there are no substitutes affording the same degree of safety. Yet, knowing that moral preachment alone is not complete as a venereal disease preventive, an outline, with specific directions for venereal prevention, was given. The scientific correctness of the medical preventives recommended, as well as the detailed directions for their use, have the approval of some of the most competent authorities in the country.

Until the time comes when the advantages from venereal prophylaxis become public property, it is hoped that the publication of the article mentioned

will serve as a stimulus for cooperation in this work for the cause of humanity. Greater progress will be made if some of the objections to teaching medical prophylaxis to the public were discussed.

It is asserted that preventive measures may, in some instances, among the feeble-minded, or among those with weak will power, or perhaps among those in a receptive mood, tend to relax the morality of those persons. I state this objection in the broadest form in order to embrace every angle of dispute. Yet, after all due credit is allowed, that objection only tries to make a plea for feeble-mindedness, lack of will power, etc. Are the majority of the peoples in the world in that class? The truth of the matter lies in the fact that many men have never been continent. Can they suddenly be made so? Admitting incontinence to be a fact, a knowledge of prevention serves as a general public protection. If every one who knows these statements to be the truth, will only apply that knowledge properly, feeble-mindedness, will power, receptive moods and other such lame excuses, which at best only operate in but few instances, will not enter into a subject requiring serious, prompt and efficient action.

The most important primary essential in a campaign for the use of venereal prophylaxis must be education. Education, first, of the ravages caused by venereal diseases, past, present and future. The public should be taught that, on account of the extreme and farreaching dangers to innocent people from those diseases, there are certain precautions that can be applied after a sexual contact that should not have taken place. Part of the public will learn of the danger in this way. To be favorably influenced in favor of the use of prophylaxis is natural, but men could not be correctly suspected of becoming less continent than heretofore because of that knowledge. To them, the very need of a prophylactic application will act as a constant reminder of danger and also as a deterrent to immoral sexual relations. It is a fact that such immoral relations are highly dangerous; once you drive that fact home to all classes, good results will follow.

There are some, no doubt, who will pay no attention to the dangers involved. They never have and perhaps never will. The knowledge of prophylaxis to that part of society could not influence their sexual behavior, except that, when properly used, it will protect them, their wives, children, relatives and neighbors from a terrible calamity.

During the late war, each government used every available avenue of propaganda to impress most forcibly upon their soldiers the real dangers from venereal diseases. The recent increase in those diseases proves conclusively that the danger was not a sufficient preventive against promiscuous sexual indulgence with certain people. However, army records establish the fact that among the same classes prophylaxis, when properly used, kept the venereal disease rate down to a very low minimum.

Moral teaching is important. It can work alongside the preventive measures of the scientist. Moral teaching alone, however, is not sufficient because germs are not usually killed by moral suasion. A better purpose will be served and more valuable results obtained if we give people scientific protection rather than frighten them. The physician does his full duty if, aside from adhering to his scientific work, he also preaches the moralist's point of view. The moral teachers have had their chance for centuries and should go on with their work. When they fail to influence a person or group, the scientist's efforts should begin, because the spread of venereal diseases in the community does not add to its morality.

No physician will state that certain patients who have had a venereal disease, never exposed themselves after getting cured. A knowledge of prophylaxis, however, prevents new infections in many such instances. If a bitter experience, such as having had a venereal disease, does not deter one from future exposures to infection, how can moral suasion expect to do it? Illicit connections are errors in people's lives. Should we consciously permit the punishment, if such it be, permanently to blast both the mistaken and their progeny? Regarded as a punishment for error, should there not be a just proportion between the offense and the consequence? Prevention of opportunity for illicit exposure is necessary; where the opportunity is created, disease prevention should exist.

A second point frequently brought out is that preventive measures may not be properly used and will therefore not be efficacious.

Just as the hypothesis that preventives may not be properly used, the opposite may be possible. It is far more reasonable to expect that those who will go to the inconvenience of providing themselves with prophylactics will also take pains to consult their physician as to their proper use. First the public must be acquainted with their existence and the results of their proper use.

A thorough campaign of education would not fail to convey all information desired. Education was used with tuberculosis, cancer, infantile paralysis and other diseases. Why not with venereal diseases? If any one brought forward as effective a remedy for the prevention of these diseases as the use of immediate personal disinfection is for venereal diseases, would any one hesitate to adopt it? With other diseases, not so disastrous or numerous, the greatest possible educational efforts are made along the lines of prevention. Why not with venereal diseases?

Preventive medicine is the glorious gift to humanity by modern science. Physicians have always led in it and will continue to do so. With a problem of such magnitude, no one could expect public opinion, including medical opinion, to crystallize suddenly. There is no reason to suppose that physicians are not interested in the prevention of those particular diseases. Some few object to it on the grounds that it is a form of self-treatment which it really is not.

Tremendous educational propaganda has been car-

ried on to prevent ophthalmia neonatorum. Many millions are spent annually to treat the blind. Many more millions are spent annually in dispensaries, hospitals, asylums, poorhouses and in private practice to treat, surgically and medically, the sick, the crippled, the feeble-minded, the paralyzed and the insane. Why not spend a small portion of that money to prevent the diseases which cause these conditions?

People generally know little about the tubercle bacilli and as little about the preventive possibilities of tuberculosis. Yet they have learned enough about both to justify one's hope that the mortality from this disease will be still further reduced. Much has already been accomplished, within the lifetime of the present generation. The amount of knowledge required for the proper use of venereal prophylaxis is infinitely smaller and can therefore be promptly learned. Once learned, the results would be uniformly effective.

Why should not a similar campaign be undertaken to enlighten the people on venereal prophylaxis and the dangers of illicit sexual relations?

The use of medical prophylaxis is the largest single factor in the prevention of venereal diseases. It is the crucial point of any program to reduce venereal diseases. If, aside from all other considerations, we recall the large economic losses caused annually by those diseases, such an educational campaign recommends itself as most worthy. We should teach the sick how to get well and the well how to keep well. It is further stated that this is a great governmental problem and should be handled by the government only.

That it would be most desirable for the national government to undertake this work goes without contradiction. The subject is of worldwide human importance. But national governments frequently look to public spirited bodies to undertake this work. For this attitude governments have ample precedent. Witness the good work and results accomplished in the campaign against tuberculosis, cancer and a number of other diseases. Most, if not all, of that work was undertaken and successfully achieved by private organizations supported by voluntary contributions. Not only is the work well done, but the government and the taxpayers saved the expense. It is sometimes necessary for private organizations to undertake a work of this nature in order to enlighten and crystallize public opinion. The Modern Health Society has good reason to feel that its work is generally approved, even from the highest quarters.

Some have suggested that the dispensary should give the necessary information. Whether this information is given by the government, public organizations, private physicians or dispensaries, the public will have to be informed of the fact that prophylaxis can be used. Many people will then get detailed information for their use from their own family physician. But few will go to a dispensary for this information, if their cases are likely to be reported. It certainly would not do to wait until one gets a venereal disease, for the treatment of which he goes to a dispensary, to give him the information about prophylaxis. A great many never

go to a dispensary, so they must get this information elsewhere. Why should we hide the knowledge of prevention from the public, or from those who are about to suffer from venereal diseases?

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132 WEST FIFTY-EIGHTH STREET.

Vitiligo and Its Relationship to Syphilis

By CHARLES GREENE CUMSTON, M. D.,
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Vitiligo and its relationship to syphilis has given rise to much discussion in France and I propose to consider this interesting subject as it stands today. First of all let me give Darier's definition of vitiligo: "A cutaneous dyschromia characterized by the development of distinctly defined white spots surrounded by a more or less hyperchromatic zone." The simultaneous existence of achromia—the disappearance of pigment at certain spots—and hyperchromia—the accumulation of pigment around decolorized spots—is consequently necessary in order to speak of vitiligo. Likewise, the dyschromia must be pure in the sense that the skin must offer no change in aspect, structure or functions. Lastly, the affection must be acquired, have appeared during extrauterine life, and not be a congenital malformation.

Spots of vitiligo are either totally achromatic or very hypochromatic, dull with a smooth surface, feeling like normal skin, and never giving the sensation of cicatricial tissue. At their onset the spots vary in size, are round or oval with distinct sinuous borders, and are distributed at random over grayish brown or blackish hyperchromatic areas which are more tinted at the edges of the white spots. As in the case of pigmentary syphilides, one has the impression that the pigment has been pushed out of the achromatic areas to the edges, and although the transition from the achromatic area to the hyperchromatic is sudden the latter gradually and insensibly blends with the peripheral normal skin.

As to hair implanted on the white spots, it is usually completely decolorized, although it may retain its normal tint for some time, but what is to be especially noted is that it does not fall out, as vitiligo does not cause alopecia. Neither does this morbid process produce any change in the normal sensibility of the skin, nor cause pain or pruritus. To all appearances the cutaneous secretions are normal. From the viewpoint of localization vitiligo may occur on any portion of the cutaneous surface, but it has a predilection for the back of the hand, wrist, forearm, face and back, as well as the genital organs and their neighborhood, and usually has a marked tendency to symmetrical distribution. It is not uncommon for the lesions to occupy simultaneously separate regions, such as the upper limbs and the face or the scalp at the same time as the abdomen and thighs.

Nothing is less uniform than the evolution of vitiligo. In some exceptional cases its development may be sudden and the process rapidly invade large surfaces, but in the majority of cases its onset is

slow and progressive and is unaccompanied by any local or general disturbance that might attract attention and it is merely by chance that the patient discovers a spot or a dyschromatic group. The evolution is gradual and almost insensible or it proceeds by outbursts with very long intervals. Once developed the process may vary with the seasons, being more marked in summer than in winter, which is in conformity with most dyschromias, and it may be ambulatory and progressive, the white areas pushing aside the hyperchromatic regions, while at the same time their achromatic tint may become so attenuated as to resemble normal skin. As to the colored portions pushed outwardly, they are limited by concave lines and may form real detached islands giving the impression of a true melanoderma. Pathologically, there is no pigment in the basal stratum of cells of the epidermis in the white spots, but it is abundant in the basal stratum of the bordering layer. In this zone a marked pigmentation of the dermis exists so that histologically there is nothing by which to differentiate vitiligo from leucomelanoderma.

Nothing precise is known as to the etiology of vitiligo but we do know, and clinical observation has furnished ample proof, that a relationship exists between this process and disturbances or morbid processes of the nervous system. The circumstances under which the disease develops are extremely variable; it can follow shortly after an accident or a nervous shock, or its origin may be detected in some nervous congenital defect. But these conditions may all be wanting and evidently something else must be looked for to explain the unforeseen appearance of vitiligo in an apparently healthy individual. Among some of the factors incriminated local irritation of some sort has been considered, vitiligo developing preferably on skin previously hyperchromatic for some reason or other, such as wearing a truss or an illfitting corset, and here arises the question of syphilis as an etiological factor of this cutaneous morbid process. Does lues act as a general cause, for example like a nervous disturbance or shock, or does it act like a local cause, such as some form of trauma?

The idea of an etiological relationship between syphilis and vitiligo is not new, because in 1889 Tenneson considered this possibility by publishing the case of a syphilitic patient, in whom, after alopecia, vitiligo developed occupying the side of the former lesion on the scalp, as well as appearing on the trunk and lower limbs. In 1892, Ducastel referred to the case of a man who since the age of three years had presented patches of vitiligo and

since the age of twelve had buccal leucoplasia. But in both these cases many data are wanting. For instance, in Tenneson's case it is not stated whether the vitiligo appeared after the syphilitic eruption and on its site, the syphilis thus acting as a local factor. This is important and observers have considered the subject from the viewpoint of the action of syphilis as a local or general cause.

The relationship between locomotor ataxia and vitiligo has been pointed out by Thibierge, who affirms that vitiligo may be the means of detecting a tabes dorsalis in the preataxic stage, and afterwards Lelcis and Chabrier have drawn attention to vitiligo developing in patients with locomotor ataxia. Ballet and Bauer have reported two instances of symmetrical lesions of vitiligo coinciding with a tabetic syndrome, while Marie and Guillain have reported the case of a patient who presented a vitiligo of the hands, scalp, neck, forehead, sacrum and lower abdominal regions and although they were unable to detect any real evidence of syphilis the patient presented trophic ulcers on both feet, absence of the Achilles and patellar reflexes and incontinence of urine.

These data have been brought forward by Marie and Crouzon to show that vitiligo—in some cases at least, is related to syphilis and they very properly say that this point of view is by no means subversive when the predilection of syphilis for the entire nervous system is recalled and also when the frequency of achromias and pigment dyschromias in syphilis is considered. At about the same time Prof. Gaucher demonstrated the similarity of nutritional disturbances in vitiligo and syphilis.

The so-called idiopathic vitiligo is supposed to result from a chronic antointoxication, the morbid agent acting by the intermediacy of the cutaneous nerves and producing a pigmentary dystrophia. Now, syphilis produces general nutritional disturbances similar to those dependent upon chronic intoxications made evident by a decrease in the elimination of urea, a decrease in the percentage of chlorides and azoturia; consequently there is no reason why, according to Gaucher, vitiligo should not be frequently found in syphilitic patients. From numerous clinical examples it would appear that syphilis plays a direct part in the production of vitiligo and the analogy existing between this primary vitiligo and primary pigmentary syphilides is striking.

In a profound study of this subject, Thibierge points out that this direct part played by syphilis is not the only one. In the cases I have referred to none of the observers had seen any cutaneous lesions on their patients that might have caused the appearance of the vitiligo. Now, what Thibierge had undertaken to show is that although sometimes directly provoking the appearance of vitiligo, syphilis may also play a part in the etiology of this lesion from the viewpoint of its localization.

Pautrier, in referring to a case of vitiligo in a leucic subject, had already established the identity existing between this dyschromia and leucomelanoderma and, according to Thibierge, a number of cases should be examined. In the first place, under certain circumstances, if trouble is taken to question

patients, it will be found that occasionally a relationship exists between the causes of the two processes, that this relationship is often wanting, and that syphilis should merely be regarded as one cause of vitiligo. But on the other hand, syphilis plays a causative or localizing part as well. Thus, an ulcerating syphilide leaves behind a more or less irregular cicatrix—often looking hardly like a cicatrix—which becomes surrounded by a diffuse pigmentation more pronounced at the periphery. Little by little the hyperpigmented surfaces develop, covering considerable areas, and in the midst of these melaniferous areas rounded zones appear in which the integument is decolorized although not preceded by either ulcerative processes or changes in the dermis.

The initial lesion, a leucic one, seems, according to Thibierge, to have acted like an excitant. It may, perhaps, have provoked a vasomotor or trophic action, and like a form of irritation, set up disturbances in the distribution of the pigment. This metasymphilitic vitiligo, says Thibierge, is similar to that observed in women whose corsets fit badly and which succeeds excoriations, while a hernia truss can produce very extensive vitiligo.

Beside these facts there are others more difficult to interpret, where ulcerating or tuberculous syphilides, after they have healed, leave a decolorized area surrounded by an intense pigmentation which extends, invading considerable areas. The decolorized areas then lose their cicatricial aspect, become smooth, flat, and assume the aspect of vitiligo absolutely, the achromatic spots exactly reproducing the shape of the syphilides which they have succeeded. It is quite natural that first of all it is supposed that such a case is similar to the preceding ones, the lesion having, at a certain phase of its evolution, the same objective characters, but circumstances can, as in one of Thibierge's cases, allow one to watch the evolution of this pseudoviteligo and then it will be seen that it is simply a more or less extensive form of syphilitic dyschromia secondary to lesions which it succeeds *in situ*. In the same way an abnormal roseola, on account of its extension, may leave a leucomelanoderma of vitiliginous aspect in its place and which nevertheless does not fulfil the requirements of Darier's definition. However, with the exception of the later instances, the influence of syphilis on vitiligo appears to be almost a certainty, but first as pigmentary syphilides of the neck are related to two different processes of evolution, vitiligo is likewise related to syphilis in two different ways.

In one case it will be impossible to discover a local cause, syphilitic or otherwise, having preceded the vitiligo, so that observers have had to consider an influence either direct or by the intermediacy of the nervous system. In point of fact all the patients in question offered unquestionable signs of syphilis or the tabetic syndrome. Vitiligo occurs with peculiar frequency in other nervous affections, such as exophthalmic goitre and syringomyelia. In other cases, if the patient is syphilitic, another factor intervenes, namely, the presence of ulcerous or tuberculolcerous cutaneous lesions and it is following these and in their proximity that vitiligo or leucomelanoderma develops.

Venereal Disease: A Public Peril*

By THE HONORABLE WILLIAM RENWICK RIDDELL, LL. D.,
Toronto.

It is a commonplace that man from the cradle to the tomb is surrounded by perils, manifold and diverse, and that do what he will he may fall a victim to disease or misfortune. But he who is forewarned is forearmed, and it is of enormous advantage that we should be informed of the dangers which surround us in order that we may as far as possible guard against them. It is the function and the duty of the council, over which I have the honor to preside, to awaken the people of Canada to one class of danger, all too little known. It is not a pleasant subject to discuss either in public or in private; it is not so pleasant to speak of the sewer and cesspool as of the park and the public garden, but it may be as necessary and is more useful.

The subject of venereal disease has long been tabooed in ordinary society; it has been thought that it was offensive to modesty; that it could not be discussed by decent or modest people; that only the doctor and perhaps the nurse should know anything of these diseases, and even they should speak of them only professionally. The idea has been prevalent, too prevalent, that they are but the wages of sin, the punishment of impurity, the result of wicked passion, wickedly indulged in. The young, the adolescent, have been shielded from the knowledge that such things are, and it would be imputed as a sin and a shame for a young man—and still more for a young woman—to acquaint himself with the causes or the effects of venereal disease.

All this has been of infinite harm to the race. You cannot clean out a cesspool by covering it with a white cloth; you cannot prevent the infection of smallpox by dusting the patient with talcum powder; vice and crime flourish none the less because they are ignored.

If the common idea were true and these diseases but the punishment of the sinner, we could have little or nothing to say. But it is not the sinner whom we have chiefly in mind, it is the innocent victim of the sin of others, the wife, the child, the unsuspecting prey to vile infection. The crying necessity of today is to combat and to overcome the current conception of these diseases.

We expected when we undertook this great and necessary work to meet difficulties, not so much active opposition as passive lethargy. We expected to walk as through a newly ploughed field with mud clinging to and obstructing the feet. We expected to meet the inertia of good people, of sincerely good people, the prejudice of our best. But these have been interested from the first and we are more than cheered with the results already attained. It is a great triumph that decent men and women can meet and discuss syphilis and gonorrhoea face to face, without a feeling of constraint; can speak of them to each other without shame and together arrange means to combat them. And that is achieved.

Notwithstanding the information which we and others have been able to spread, there is still great ignorance of the ravages of venereal disease. It has been said so often that it may have lost much of its force, that there are probably half a million persons in the Dominion of Canada infected with syphilis—in Toronto probably at least 40,000—and many more with gonorrhoea.

But let us give more concrete examples. One of the most important wards in a great hospital is the gynecological ward for the treatment of diseases of women, and a great proportion of the patients in such wards are sent there through venereal disease. If these diseases were abolished tomorrow, the gynecological ward might almost be closed so far as future patients are concerned. Many a young bride finds herself in such a ward, and not a few find an early grave from infection from those who have just sworn to love and cherish them. Not long ago a mother came to me with a heart rending story of her beautiful and accomplished daughter, dying within a few months of her marriage, killed by infection from her husband's disease.

Of those blind from birth, which constitute four fifths of all the blind, more than ten per cent. are blind because of infection at birth.

The other day I told the Treasurer of the Province that if we could abolish venereal disease and its consequences, we would save seventy per cent. of all the expenditures of the province on hospitals and asylums—and my assertion was well within the mark. The imbecile, the moron, the insane, the paralytic, are in many instances the fruit of the dire enemy, syphilis, and the province is burdened with the support of the helpless; the case of the criminal and the near criminal is in great measure her work.

There is much to be told of the method of infection: there is still much to learn. The other day I was told by a great New York physician that after many years' study and experience he was by no means certain that he knew all the many ways whereby the disease was spread. Indeed we cannot always be absolutely certain whether a person is infected. Hundreds and thousands of persons are infected without their knowing it and the celebrated Sir William Osler used to say that if the diagnostician knew the many forms which that disease took, all other things diagnostic were added unto him. While the presence of certain well known symptoms makes it certain that the disease exists, their absence does not make it certain that the disease does not exist.

It is one of our duties to teach the ways of these diseases, but that is only one of our duties; another is to identify and to cure. There are seven clinics in active operation in Toronto; and these are well attended. I am informed that as many as two hundred patients are to be found in a clinic in one day. Think what this means. Two hundred men afflicted

*Address delivered before the Canadian National Council for Combating Venereal Disease, Toronto, April 22, 1921.

with a deadly disease, suffering themselves, a peril to the rest of the community. Life shortened a fourth or more, efficiency and ability to earn diminished by half, perhaps gone altogether; unless a cure is effected, locomotor ataxia, disablement, perhaps paresis, certainly diminished mental capacity, hardening of the arteries, shuffling off to a premature grave. What a spectacle!

But that is not all, not even half. The innocent wife infected, suffering and dying, the children born weaklings in body and in mind; perhaps, as is too often the case, imbecile or at least of small mental equipment, unable to learn like other children, fatally handicapped in the work of life. It is from such that many of our prostitutes are made, many of those guilty of sexual and other crimes, most of the inmates of our asylums for the feeble-minded. The father being unable to earn a livelihood for his family the mother may be forced to work and so to neglect her children, or the children deprived of their right to a childhood of freedom from care and toil, their right to at least a few years of happiness. And these are they for whom the city or the province must care. It is money in the pocket of both to strike at the root, to abolish the cause.

There are good women and good men who are devoted to the blind, giving up leisure and rest to help even a little to mitigate their hard lot. Will they not take an interest in a work which is to pre-

vent blindness in the future generations? There are good women and good men who watch over and care for the feeble-minded; will they not help us to prevent feeble-mindedness increasing? There are good women and good men who give themselves to caring for the insane. Will they not lend their aid in striking at the root of much of the insanity? Our splendid boys passed over the seas to fight and if need be to die, that Canada might be free. Are we not all called upon to do all we can to make Canada clean, to make and keep the manhood and womanhood of Canada what God intended them to be, straight and fair and pure?

We, the council, can do little of ourselves; we can do everything with the help of our countrymen and countrywomen. We ask for your assistance—financial assistance, for nothing can be done without money; but far more we ask for your personal interest in our work and your sympathy with us in our objects, and we know Toronto and Canada too well to fear that we shall not succeed.

We intend to work in harmony with the council in Great Britain and with similar organizations in other countries, especially in our nearest neighbor, the United States, whose problems are almost identical with our own. We confidently appeal for aid, moral and material, to the patriotic citizens of Canada.

OSGOODE HALL.

A Solution of Sodium Iodide for Use in Urological X Ray Studies*

New Technic for Its Employment

By MAXIMILIAN STERN, M. D.,
and I. SYDNEY RITTER, M. D.,
New York.

During a series of experiments with a solution of sodium iodide in the remote manifestations of Neisserian infections (1), it occurred to us that the solution in the form in which it was being supplied to us would lend itself admirably to renal injection. At that time we were employing ampoules containing twenty c.c. of a ten per cent. solution of the salt. Radiograms were satisfactory, but not quite as definite as could be desired. The conspicuous lack of irritating symptoms, however, encouraged us to order ampoules of the same size containing a twenty per cent solution, and again we noted no disagreeable effects upon the patient. This salt is certainly less irritating and more easily disposed of by the kidney than any we had hitherto employed, including the bromides, iodides and thorium.

A technic was evolved (Fig. 1) which was more convenient than any we had previously employed. It is only necessary to open the ampule and apply

a two hole cystoscopic rubber cap. Through one opening of the cap the ureter catheter from the patient is inserted, and through the other a short length of discarded ureter catheter to extend to the bottom of the ampule. To the free end of this catheter a twenty c.c. Luer syringe filled with air is applied for the purpose of emptying the ampule by air pressure.

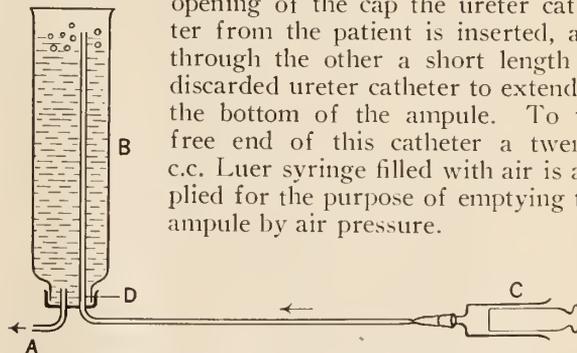


FIG. 1.—Apparatus for applying sodium iodide solution for x ray studies. A, catheter from patient; B, ampoule of sodium iodide, twenty per cent, twenty c.c.; C, Luer syringe containing air; D, double perforated cystoscope cap.

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1. STERN and RITTER: A New Method of Treating Remote Manifestations of Gonorrhoeal Infections, *Medical Record*, January 31, 1920.

219 WEST EIGHTY-FIRST STREET.

*From the Urologic Service of the Broad Street Hospital in the City of New York.

Editorial Articles

ARABIAN AND GREEK MEDICINE IN ROME.

Arabian medicine, especially from the therapeutic aspect, has always held a high place and therefore its history is not only valuable but fascinating. In the present time of strain and unrest, when forces are at work to destroy thoughts and ideals the products of centuries of struggle, the clarifying effect of history should be desired and sought. The need of historical knowledge is as obvious in medicine as in other branch of learning. Such a knowledge is calculated to counteract the state of confidence engendered in the medical student's mind by the apex to which medicine has reached, or is supposed to have reached.

Medical history has been greatly neglected by the medical profession, partly because of the dry as dust nature of the histories hitherto published. A reproach of this kind cannot, however, be brought against two of the Fitzpatrick Lectures of 1919-20 and those of 1909-10. The former of these, by Edward G. Browne, deal with Arabian medicine and are published in book form by the Cambridge University Press. The latter are by that remarkably able and versatile physician and writer, Sir T. Clifford Allbutt, regius professor of physic at the University of Cambridge, and are published in book form by Macmillan, London. No accusation of dryness can be brought against the authors of these two groups of lectures. Browne's lectures seem to exhale the atmosphere of the mysterious East, and even suggest in places tales from the *Arabian Nights*.

At the outset the lecturer pointed out a fact not generally recognized, that Arabian medicine was not, speaking accurately, altogether Arabian medicine. It was not mainly the work of Arabs or even Mohammedans, but of Syrians, Hebrews, or Persians, of the Christian, Jewish or Magian faith. By Arabian medicine the torch of Greek medicine was kept aflame through the Dark Ages until the dawn of the Renaissance. But although Arabian medicine was by no means wholly Arabian, the acquisition of Greek medical learning brought into Persia by refugees was greatly stimulated by the Abbasid Caliphs of Bagdad, under whose fostering care learned men were attracted to their courts, and the translation of Greek manuscripts into Arabic was encouraged. As is pointed out in a review of Professor Browne's lectures in the *Spectator*, August 20, 1921, some Greek manuscripts, lost in the original, are preserved in Arabic translations. seven books of Galen's

Anatomy being among the number. It would further appear that many of the earlier translations were made from Greek into Syriac and from the latter language Arabic translations were made later.

The lectures afford little evidence that progress was made by the Arab writers in the science of medicine nor did the lecturer think that further research will be fruitful in this field. The chief merit of the Arabs was that they were keen observers of Nature. Some of their clinical work was good. The well known Rhazes, whose real name was Abu Bekr Muhammad ibn Zakariyya of Kay, called in Arabic ar-Kazi, gave in his *Harwi* or *Continens* an excellent account of his differential diagnosis of pyelitis or urinary fever from malaria. Rhazes also wrote what is probably the earliest monograph on smallpox and measles.

Abu Ali Husayn Ibn Abdullah Ibn Sina, who lived between A. D. 980-1037, was another distinguished Arabian physician and wrote the celebrated *Quanun*. He was a versatile man, being not only a physician but a prime minister and poet. It is maintained with some plausibility that he wrote the quatrain attributed to Omar Khayyam:

Up from Earth's Centre through the Seventh Gate
I rose, and on the Throne of Saturn sate,
And many a Knot unravel'd by the Road;
But not the Master-knot of Human Fate.

In the third lecture many good anecdotes are related, one of the most amusing of which is the description of Rhazes's adoption of heroic measures in the treatment of the Amir Mansur for rheumatic joints. The treatment consisted of psychotherapy and physiotherapy, a treatment so drastic, that the physician was compelled to flee from the court. Love is classed in the *Quanun* under the head of cerebral or mental diseases. As Professor Browne has said, there were few notable physicians among the Arabs themselves and yet by their encouragement of others they have placed the world under a great debt to them. Sir Clifford Allbutt's lectures, while they cannot be designated as dry, are weightier and more difficult to read than those of Professor Browne. The Romans received practically all their scientific medicine from the Greeks. Consequently, he finds it incumbent upon him to trace the development of scientific ideas in early Greece. Thales, who lived 640-548 B. C., had already advanced the theory that evolution began from some indifferent primary substance. Parmenides postulated a doctrine of the conservation of matter. The atomic

theory was evolved in the fifth century B. C. by Leucippus and Democritus, and built up on the law of evolution by relative proportions, which again was based on the work of Pythagoras on harmonies. In the review of Greek medicine the Alexandrian school is especially mentioned and the doings of such famous Greek practitioners as Asclepiades, Aretaus, and Galen are sketched in some detail. The Pneumatists, the Methodists, the Empiricists are briefly explained, an explanation obviously necessary, considering the influence these sects exerted on medical progress.

Other lectures and essays, in addition to the Fitzpatrick Lectures, are contained in the volume by Sir Clifford Allbutt, *Lectures on Byzantine Medicine and Salerno*, and particularly worthy of notice an essay dealing with scientific medicine, *Medicine in the Twentieth Century*. These Fitzpatrick Lectures are valuable as history on a subject where good history is badly needed. They are not only good history but excellent examples of high literary knowledge and skill. Arabian medicine is well revealed by Professor Browne, whose lectures are amusing and fascinating as well as learned and informative. Of Sir Clifford Allbutt's medical knowledge and literary gifts little remains to be said. Medical history has been appreciably advanced to the great benefit of the profession by the publication of these lectures.

THE NEW PSYCHOLOGY.

A comparison of psychoanalysis as a psychological method with the older experimental psychology has been undertaken by Dr. Oskar Pfister. He is trained in psychology, he is thoroughly acquainted with psychoanalysis. He knows through experience the application of the latter to the problems which beset the adolescent as well as the adult. He has had opportunity to observe the failure of the older classical psychology to reach the vital problems which lie in all these territories.

It is with this authority of the man of experience that he takes up the question of the position of psychoanalysis in a recent volume (*Zum Kampf um die Psychoanalyse, Internationaler psychoanalytischer Verlag, Leipzig, Vienna, 1920*). He is frankly aware of the aims and the methods of the older psychology. He pays all deference to the sincerity and the results as far as they go. Yet he realizes that psychoanalysis begins where the older psychology of necessity leaves off. He is able to cite a number of psychologists, pedagogues, psychiatrists who have expressed the dissatisfaction felt in regard to former methods and their capacity for reach-

ing human problems. This in many cases means a recognition that the principles of psychoanalysis offer a means of progress where the older methods offered nothing.

Pfister is ready to examine some of the criticisms launched against psychoanalysis. It cannot be objected, he urges, that psychoanalysis is not an experimental psychology. Wundt's definition of experiment is this: "The experiment consists of an observation which is combined with the voluntary action of the observer upon the origin and the course of the phenomena to be observed," conditions which psychoanalysis fulfills. Furthermore, psychoanalysis applies its observation to more than voluntarily submitted matter. It considers all regions of the psyche, those also which are completely withdrawn from the ordinary experiment, those deep within the personality or those which have gone out into the highest expressions of genius. It follows the intricacies and varieties of individual action, not confining itself to the following out of mathematically conceived laws. Still further it examines its objects not in artificial isolation but in their natural setting in the whole of life. Psychoanalysis is the first scientific individual psychology. Its interest is the individual development within the subject himself and in relation to the society in which he moves.

Pfister removes certain other objections to psychoanalysis. He makes a simple clear statement of the place the sexual holds in Freud's theory. Freud's aim was not to press an exclusively sexual interpretation upon all discovered. The fact, however, was that he found the sexual to have far more place in the hidden, mental life than any one had supposed. This is true whether sexual is considered in its more limited sense or with that wider meaning with which Freud has used the word to cover many manifestations indirectly related to sex.

Pfister further exonerates Freud from an attempt to make a philosophy of his psychology. "His classical psychoanalytic works are completely free from philosophical discussions. This omission—be it an advantage or a disadvantage—is connected no doubt with his personal professional position and talent but certainly also with his great modesty toward problems of which he does not as specialist and master have control." Pfister counts Freud the first great positivist in psychology in that he has broken with the idea that given objective facts with their definite connections were the only objects of psychology. As he had to turn away to wider and deeper territory so also he had to forsake the methods of such dogmatic psychology.

This fair statement of the situation convinces the reader that psychoanalysis has advanced through the

spirit which the writer advocates, that it will fully win and maintain its place in the field of scientific psychology. For as Pfister says, "What must necessarily serve as sword and shield for the champion of psychoanalysis are courage and humility."

THE GOSPEL OF CLEANLINESS.

Personal and domestic cleanliness is now recognized by the medical profession generally as one of the main planks in the campaign of preventive medicine. The carrying into effect of public health measures wisely conceived has resulted in the practical abolition and deadly epidemics which at one time devastated populations, that is, in civilized countries, but the influence of unclean conditions is still shown in backward countries, such as in parts of Asia and South America. This baneful influence has been more strikingly exemplified in lands most affected by the war, Russia and Poland, for instance, where diseases such as typhus, born of and fostered by dirt, are flourishing like the green bay tree. As previously stated, in civilized countries many fearful epidemic diseases have been wiped out to all intents and purposes, and at the present time efforts are being directed chiefly toward driving out dirt in houses and to the preaching of the gospel of personal hygiene. John Wesley once said that cleanliness was next to godliness, and it is true that an individual who is not personally clean and whose immediate surroundings are not more or less immaculate is unable to preserve true self-respect and is certain to deteriorate and even to become degraded to a greater or less extent.

In an eloquent address delivered at a recent meeting of the British Sanitary Inspectors' Association, Sir James Crichton Browne enunciated with much clarity the tenets of personal cleanliness and domestic hygiene. It may be interpolated here that to the influence of the Mosaic law can be traced the evolution of domestic and personal hygiene. The Greeks and Romans largely practiced the cult of the bath, while at the present time the palm for frequent bathing must be awarded to the Japanese, who alone of the Asiatic peoples preach and practice personal and domestic cleanliness. In Tokio there are today eight hundred public baths in which three hundred thousand persons, or about one-fourth of the population, bathe every day at the cost of one cent for each hot bath. Beside this, every family, except some of the poorest, has its own private bathroom in the house, or at least, a tub and plenty of hot water. Great numbers of Japanese take two or three hot baths a day, and express great amazement at the foreigner who refuses to

take even one. It is quite obvious, however, that adequate facilities for bathing should be provided in every country, in order that a high standard of health may be maintained.

Sir James Crichton Browne dealt at length with another question which ultimately concerns the health of the people at large and perhaps constitutes the most dangerous obstacle on the road to health; this is venereal disease. He declared without equivocation that syphilis should be prevented and stated in the plainest terms that the spread of venereal disease could be prevented by the prompt use of appropriate methods of disinfection. This is the policy of the British Society for the Prevention of Venereal Disease, but is one which does not find favor with a considerable proportion of the British medical profession, although Sir James Crichton Browne "is convinced that at the present time it is the most effective weapon in combating venereal disease."

Of course, there are always two sides to a question. The Society for the Prevention of Venereal Disease asserts that during the war immediate self-disinfection proved its efficacy without a shadow of a doubt, and that under civil conditions it could be adopted, if not with equally good results, at any rate with results that are eminently satisfactory. The British National Council for Combating Venereal Diseases oppose this decided expression of opinion, and deny that immediate self-disinfection is either feasible or desirable among a civil population.

The fact remains that venereal disease is remarkably prevalent, that it is wreaking incalculable harm, and that existing measures appear to have no great retarding influence on its progress. The real point seems to be that while remedial and curative measures are immensely improved, the true policy is prevention rather than treatment; however greatly such treatment may be improved.

Some authorities aver that beyond a certain stage syphilis is incurable. Immediate disinfection may not be so effective or so easily applied as its advocates declare, yet if a goodly proportion of cases of venereal disease are prevented by its adoption, the method appears to be worthy of trial.

This is an international matter of the most serious import, and is of as great interest to the medical profession in this country as in any other country. It would therefore be instructive and valuable to learn the views of the American medical profession on immediate self-disinfection. Army surgeons here should have something to say on the subject. Nothing very effective can be done in preaching the gospel of cleanliness so long as venereal dis-

eases rage. The most essential step to be taken to further the cause of cleanliness, preventive medicine is to derive means to kill or severely scotch these most destructive and insidious diseases of the day. Also the question should be discussed without prejudice or animus by the medical profession in all parts of the world, and in these discussions the American medical profession should play a leading part.

HISTORY AGAIN REPEATS

"Some time in the month of October —, I attended Miss A. C. with a rheumatism in her hip joint, which yielded for awhile to the several remedies for that disease. In the month of November it returned with great violence, accompanied with a severe toothache. Suspecting the rheumatic affection was excited by the pain in her tooth, which was decayed, I directed it to be extracted. The rheumatism immediately left her hip and she recovered in a few days. She has continued ever since free from it.

"Soon after this I was consulted by Mrs. J. R. who had been affected for several weeks with dyspepsia and toothache. Her tooth, though no mark of decay appeared in it, was drawn by my advice. The next day she was relieved from her distressing stomach complaints, and has continued ever since to enjoy good health. From the soundness of the external part of the tooth, and the adjoining gum, there was no reason to suspect a discharge of matter from it had produced the disease in the stomach.

"Some time in the year——, I was consulted by the father of a young gentleman in Baltimore, who had been affected with epilepsy. I inquired into the state of his teeth, and was informed that several of them in his upper jaw were much decayed. I directed them to be extracted. . . . He followed my advice, in consequence of which I had lately the pleasure of hearing from his brother that he was perfectly cured.

"I have been made happy by discovering that I have only added to the observations of other physicians, in pointing out a connection between the extraction of decayed and diseased teeth and the cure of general diseases."

"I cannot help thinking that our success in the treatment of all chronic diseases would be very much promoted by directing our inquiries into the state of the teeth in sick people, and by advising their extraction in every case in which they are decayed."

If the reader were asked to insert the year where it has been omitted in the printing of the quotation given above, we believe, save that a suspicion aroused by the style might cause him to hesitate, that

he would at once say that the first two figures must be 19. As a matter of fact the true date is 1801, and the apparently recent remarks are from the pen of Benjamin Rush. Truly there is nothing new under the sun, or at least nothing much, and we should blush at the selfrighteous hue and cry we make over some of our medical "discoveries." It is quite true that Dr. Rush knew nothing of bacteria nor of focal infection, but this only makes his suspicion of the connection between a defective tooth and a lame hip the more remarkable. As for the other cases, we are not sure but that Rush saw more clearly the true connection between primary disease and secondary disease, for we are too likely to ride our hobby of focal infection when we should be mounted on a horse of another color.

RECOGNITION.

Here and there we find an admirer of Samuel Butler, one who reads and revels in his brilliant elucidation of unconscious memory as the prime factor in evolution. To most American readers Butler is known only as a writer of fiction. In England and on the Continent his works on evolution have a small yet ever growing circle of admirers. When he attacked Darwin's major hypotheses of evolution he was ignored and cast aside, yet his theories are infinitely more sound and have more potentiality in their relationship to evolution, biology and the medical sciences.

Bergson has used many of Butler's ideas in the construction of his philosophy. Shaw's latest play, *Back to Methuselah*, epitomizes Butler's ideas. Sémon, one of Europe's keenest minds, frequently quotes Butler. Rivers in his book *Instinct and the Unconscious*, gives Butler credit for having established unconscious memory on a fundamental scientific basis. And many others could be cited who have dug into the scientific works of this writer who is little known for his offerings to science. Darwin's name, position and popularity overshadowed him, yet Butler's work was more fundamental. He was a simple layman; he had not even worked in a laboratory. What had he to offer to science? Much! Much more than many hoaryheaded scientists who were stifled by the thick walls of their colleges; more than many who did not have an original fundamental idea; more than those who fortified themselves with musty volumes and ponderous degrees.

Butler wrote four small volumes on evolution. These will live when many standard textbooks have been revised—and buried. They will one day serve as a foundation for a new concept of evolution—unconscious memory. American readers would do well to read more of Samuel Butler's scientific

works. In them they will find ideas worthy of careful consideration, ideas that may serve as foundations for constructive building.

SPECIAL CARDIOVASCULAR NUMBERS.

In order better to formulate our program we have decided to postpone the publication of our first special cardiovascular number until January 18th. So much material of a high quality has been received that two issues will be necessary. These numbers will contain the latest researches on diseases of the heart and bloodvessels. Among the contributors will be the foremost authorities on this subject in Europe and America. These numbers on the heart and bloodvessels will be worthy of careful reading.

News Items.

Immunization Clinic at New York Hospital.—On Tuesday and Thursday evenings a clinic will be held at the New York Hospital for the treatment of hay fever, asthma, eczema, and poison ivy. Immunization against typhoid fever and diphtheria will also be administered.

Dinner to Dr. Gibney.—Dr. Virgil P. Gibney, for fifty years surgeon to the Hospital for Ruptured and Crippled Children, New York, was given a testimonial dinner at the Hotel Commodore, on the evening of November 22d, by the physicians associated with him in his work, as an expression of appreciation of his long and faithful service.

New York Academy of Medicine Election.—Dr. Arthur B. Duell was elected vice-president of the New York Academy of Medicine for three years at the annual election held on December 1st. Dr. Royal S. Haynes was elected recording secretary and Dr. Charles L. Dana, trustee for a term of five years. Dr. George David Stewart's term of office as president has not expired.

Medical Society of the County of New York.—At the one hundred and fifteenth annual meeting of this society, held November 28, 1921, the following officers were elected for the ensuing year: President, Dr. Orrin S. Wightman; first vice-president, Dr. Arthur F. Chace; second vice-president, Dr. Eugene H. Pool; secretary, Dr. Daniel S. Dougherty; assistant secretary, Dr. John Milton Mabbott; treasurer, Dr. James Pedersen; assistant treasurer, Dr. William TenEyck Elmendorf.

Dr. Lorenz Cordially Received at the Academy of Medicine.—Dr. Lorenz delivered an address before the Society of Medical Jurisprudence at the New York Academy of Medicine, Monday evening, December 12th. He was introduced by Dr. Dexter D. Ashley and received a warm reception. Dr. Nathan B. Van Etten, the chairman, referring to him as the leader in his field. In the course of his address Dr. Lorenz said that he hoped his visit would promote the idea that war and science were incompatible. He said that just as human suffering was international, so science and the relief of suffering were international and that the only war that should be waged was war against disease.

Health Commissioner Copeland Asked to Serve Another Term.—Dr. Royal S. Copeland has been asked to serve as health commissioner for another term of four years. He has not yet made a decision in the matter.

Typhus in Russia.—According to press despatches from Moscow, typhus fever is sweeping Russia with increasing violence, especially in the regions where famine is severe. There are more than two thousand cases of the disease in the hospitals of Moscow.

Medical Intern at St. Elizabeth's Hospital.—Applications will be received by the United States Civil Service Commission up to March 1, 1922, for an examination to fill the position of medical intern at St. Elizabeth's Hospital, Washington; salary, \$1,200 a year and maintenance.

Civil Service Examination for Röntgenologist.—Vacancies in the position of röntgenologist in the United States Veteran Bureau and the Public Health Service will be filled from examinations to be held by the United States Civil Service Commissions. Applications will be received up to March 31, 1922.

An Unusual Case of Multiparity.—A report comes from Mexico City that on December 10th a woman in Tampico gave birth to eight children, all stillborn. The mother is said to be well. The Mexico City Medical Association is investigating the authenticity of the report.

Public Health Service Needs Surgeon's Assistants.—The United States Civil Service Commission announces an examination for surgeon's assistant in the dental, eye, ear, nose and throat work to fill vacancies in the United States Public Health Service. Applications will be received up to March 31, 1922.

More Deaths by Violence in Chicago.—It is reported that the number of homicides, suicides and deaths by violence in Chicago this year will break the city's record. The total deaths from these causes number 2,525, for the first eleven months of the year, compared with 2,117 during the first eleven months of 1920 and 2,360 for the entire year.

Bacteriologists Wanted in the Public Health Service.—The United States Civil Service Commission announces examinations for the positions of bacteriologist, associate bacteriologist, assistant bacteriologist and junior bacteriologist in the United States Public Health Service. Applications for these examinations will be received by the commission at Washington until March 31, 1922.

Annual Meeting of Railway Surgeons.—The thirty-first annual meeting of the New York and New England Association of Railway Surgeons was held in New York on Saturday, October 29th, and was one of the most successful meetings ever held by the association. The following officers were elected for the ensuing year: President, Dr. Donald Guthrie, of Sayre, Pa.; first vice-president, Dr. J. K. Stockwell, of Oswego, N. Y.; second vice-president, Dr. Edgar Vander Veer, of Albany, N. Y.; treasurer, Dr. J. M. Hamilton, of Rutland, Vt.; recording secretary, Dr. Horace H. LeSeur, of Batavia, N. Y.; corresponding secretary, Dr. George Chaffee, of Binghamton, N. Y.

Public Health Service Entrance Examinations.

—The examinations of candidates for entrance into the Regular Corps of the United States Public Health Service will be held on January 9, 1922, at Washington, D. C., and San Francisco, Cal. Candidates must be between twenty-two and thirty-two years of age, and graduated from a reputable medical school. They must pass satisfactory oral, written, and clinical tests before a board of medical officers. Successful candidates will be recommended for appointment by the President with the advice and consent of the Senate. Requests for information or permission to take this examination should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C.

National Health Exposition at Louisville.

Under the auspices of the United States Public Health Service, the State Board of Health of Kentucky, the Jefferson County Board of Health, and the Health Department of the City of Louisville, a health exposition will be held in Louisville, Ky., February 1 to 9, 1922. There will be exhibits in hospitalization, dentistry, medicine and pharmacy. The University of Louisville, the public school system, and various local, state and national health organizations will participate. The annual conference of the city and county health officers, the annual convention of the Kentucky State Public Health Association and other health meetings are already scheduled in connection with the exposition. An institute will be conducted by the United States Public Health Service.

Physiotherapy Clinics for Physicians.

—The American Electrotherapeutic Association and the New York Electrotherapeutic Society have arranged a joint midwinter clinical session to be held on December 29th and 30th, at the United States Public Health Service Hospital No. 61, at Fox Hills, Staten Island, N. Y., where a demonstration of physical therapeutics, open to physicians generally, will be held under the auspices of the United States Public Health Service. There will be explanations and demonstrations of all physical modalities, and of the results obtained. The opening meeting will be held at the New York Academy of Medicine on Wednesday evening, December 28th, 8.30. All medical men are invited to attend, and programs and admission cards to the clinics may be obtained from Dr. Richard Kovacs, 223 East Sixty-eighth Street, New York, without expense.

Personal.—Dr. J. Morton Howell, of Dayton, Ohio, has been appointed diplomatic representative and consul general for the United States in Egypt. He sailed for Cairo early in November.

Congress has confirmed the nominations of Dr. Joel E. Goldthwait, of Boston, and Dr. Walter B. Cannon, of Harvard Medical School, to serve in the Medical Reserve Corps of the United States Army, with the rank of brigadier general.

Dr. James H. Mason Knox, Jr., associate in clinical pediatrics, Johns Hopkins University, has been granted a year's leave of absence to assume charge of child welfare work in Europe under the Red Cross Society.

Prison Sentence for Salvarsan Adulteration.

The salvarsan adulterations in Germany and other countries which caused so much difficulty in the drug markets during 1919 and 1920, were recently taken up by the Criminal Court of the County of Hamburg. After a trial lasting fourteen days, in which many experts were examined, the manufacturer, Gerloff, and his superintendent, von der Heyde, were sentenced to three and a half years in prison and to five years disenfranchisement. Sixteen defendants received two year prison sentences each, and sixty-two others, who had conducted a flourishing business in adulterated salvarsan, were fined twenty thousand marks. Six persons were acquitted.

Died.

BEACOM.—In Kecksburg, Pa., on Tuesday, November 22nd, Dr. Albert Alonzo Beacom, aged forty-six years.

BOICE.—In Philadelphia, Pa., on Friday, December 2nd, Dr. J. Morton Boice, aged forty-five years.

BRUNS.—In St. Henry, Ohio, on Tuesday, November 22nd, Dr. William H. Bruns, aged thirty-three years.

BUCK.—In New York, on Sunday, December 4th, Dr. Francis D. Buck, aged seventy-two years.

BUTLER.—In Keene, N. H., on Wednesday, November 30th, Dr. John F. Butler, aged ninety-one years.

CHAMBERLAYNE.—In Rochester, N. Y., on Monday, November 28th, Dr. Louise F. Chamberlayne, aged seventy-six years.

CHANNING.—In Brookline, Mass., on Wednesday, November 23rd, Dr. Walter Channing, aged seventy-two years.

COLBURN.—In Richmond, Ind., on Thursday, November 17th, Dr. Clarence P. Colburn, aged sixty-two years.

COLTER.—In Marinette, Wis., on Saturday, November 12th, Dr. George Fred Colter, aged fifty-six years.

COOK.—In Los Angeles, Cal., on Thursday, November 10th, Dr. Benjamin Harvey Cook, of Anderson, Ind., aged sixty-three years.

CONDORY.—In San Francisco, Cal., on Friday, October 28th, Dr. Vilmas Condory, aged eighty-four years.

CROOKER.—In Augusta, Me., on Sunday, November 27th, Dr. Leander J. Crooker, aged fifty-two years.

CURRENS.—In Two Rivers, Wis., on Thursday, December 1st, Dr. John Randolph Currens, aged sixty-six years.

DANFORTH.—In New York, on Wednesday, November 9th, Dr. Loomis Le Grand Danforth, aged seventy-two years.

DICKIE.—In Richmond, Va., on Friday, November 4th, Dr. Willis W. Dickie, aged eighty-seven years.

DODGE.—In San Francisco, Cal., on Thursday, November 10th, Dr. William Henry Dodge.

EASTON.—In Syracuse, N. Y., on Saturday, November 12th, Dr. Frederick Edward Easton, aged sixty years.

FLINN.—In Wilmington, Del., on Tuesday, November 22nd, Dr. Irvine M. Flinn, aged sixty-eight years.

FLYNN.—In Pittsfield, Mass., on Sunday, November 13th, Dr. John J. Flynn, aged sixty years.

FOLGER.—In Flushing, N. Y., on Sunday, November 13th, Dr. Rupert A. Folger, of Whitestone, aged forty-eight years.

FRANCIS.—In Glens Falls, N. Y., on Wednesday, November 2nd, Dr. Louis Francis, of Pelham Manor, N. Y., aged eighty-five years.

GARRISON.—In Toulon, Ill., on Thursday, November 3rd, Dr. William L. Garrison, aged fifty-three years.

HENDRICKSON.—In New Holland, Pa., on Friday, November 11th, Dr. Louis H. Hendrickson, aged forty-eight years.

HERZOG.—In Watertown, Ill., on Friday, November 11th, Dr. Albert E. Herzog, of Ottawa, Ill., aged forty-five years.

HITCH.—In Pocomoke City, Md., on Wednesday, November 9th, Dr. William S. Hitch, aged eighty-eight years.

DENNISTON.—In Washingtonville, N. Y., on Friday, November 18th, Dr. Robert Denniston, aged fifty-one years.

ENSOR.—In Cookeville, Tenn., on Thursday, November 17th, Dr. L. D. J. Ensor, aged sixty-six years.

GARLAND.—In Gloucester, Mass., on Saturday, November 26th, Dr. Albert Stone Garland.

GODDARD.—In Appleton, Wis., on Friday, December 2nd, Dr. Nathan Andrews Goddard, of Milwaukee, aged forty-six years.

GOODWILL.—In Laurel Hill, N. J., on Friday, December 2nd, Dr. John J. Goodwill, aged thirty-six years.

GORDON.—In Fort Wayne, Ind., on Monday, November 21st, Dr. Charles Wesley Gordon, aged sixty-nine years.

GRISWOLD.—In Fredonia, N. Y., on Friday, November 26th, Dr. Vernon M. Griswold.

HOLLIS.—In Watertown, Conn., on Sunday, November 8th, Dr. Austin W. Hollis, of New York, aged fifty-three years.

JONES.—In Dillonvale, Ohio, on Friday, December 2nd, Dr. John C. Jones, aged fifty-two years.

KOCH.—In Kansas City, Mo., on Wednesday, October 23rd, Dr. Albert G. Koch, aged forty-one years.

KNAPP.—In Sandpoint, Idaho, on Wednesday, November 16th, Dr. William M. Knapp, aged seventy-four years.

KRUM.—In Reading, Pa., on Tuesday, November 22nd, Dr. Thomas E. Krum, aged sixty-one years.

KUPP.—In Reading, Pa., on Monday, October 31st, Dr. D. Webster B. Kupp, aged sixty-four years.

LAUBACH.—In Easton, Pa., on Sunday, December 4th, Dr. Stephen Laubach, aged ninety-two years.

LINDSAY.—In Los Angeles, Cal., on Wednesday, November 23rd, Dr. Johnson C. Lindsay, aged seventy-seven years.

MANN.—In Saxapahaw, N. C., on Monday, November 21st, Dr. E. D. Mann, aged eighty-one years.

MAYFIELD.—In Salina, Kan., on Wednesday, November 9th, Dr. Amanuel B. Mayfield, aged sixty-seven years.

MCCLINTOCK.—In Jacksonville, Fla., on Saturday, October 29th, Dr. Charles T. McClintock, aged sixty-one years.

McHUGH.—In Pittsburgh, Pa., on Wednesday, November 2nd, Dr. Grant M. McHugh, aged fifty-two years.

MCLAUGHLIN.—In Philadelphia, Pa., on Thursday, December 1st, Dr. John J. McLaughlin, aged fifty-eight years.

MOORE.—In Spokane, Wash., on Monday, October 31st, Dr. George W. H. Moore, of Chelan, aged sixty-four years.

MOORE.—In Folkston, Ga., on Thursday, November 10th, Dr. John A. Moore, aged forty-four years.

MOREY.—In Omaha, Neb., on Wednesday, November 9th, Dr. Pierre Colon Morey, aged fifty-five years.

MOUNSEY.—In Louisville, Ky., on Sunday, October 23rd, Dr. George T. Mounsey, aged fifty-nine years.

NEAD.—In Chambersburg, Pa., on Wednesday, November 30th, Dr. Daniel W. Nead, of Reading, aged sixty-three years.

NEHRBAS.—In Brooklyn, N. Y., on Monday, November 14th, Dr. Jacob Nehrbas, aged sixty-six years.

NEUPHER.—In Mt. Joy, Pa., on Wednesday, November 9th, Dr. John J. Neupher, aged sixty-seven years.

NICHOLS.—In Clarksdale, Miss., on Tuesday, November 23rd, Dr. H. W. Nichols.

O'BRIEN.—In Eden, Wis., on Sunday, November 13th, Dr. Thomas J. O'Brien, of St. Nazianz, aged fifty-seven years.

O'HARA.—In Waterbury, Conn., on Friday, November 25th, Dr. Bernard A. O'Hara, aged sixty-two years.

ORT.—In Springfield, Ohio, on Thursday, November 24th, Dr. Wallace A. Ort, aged forty-three years.

OSBORN.—In Bridgeport, Conn., on Wednesday, October 26th, Dr. George Wakeman Osborn, aged sixty-one years.

PATON.—In Oil City, Pa., on Monday, November 14th, Dr. Samuel M. Paton, aged sixty-three years.

PAUL.—In Shreveport, La., on Sunday, October 30th, Dr. Banks I. Paul, of Benford, Tex., aged thirty-four years.

PELLETIER.—In Ludington, Mich., on Wednesday, November 9th, Dr. Louis J. Pelletier, aged sixty-six years.

PHILLIPS.—In Erie, Pa., on Wednesday, November 16th, Dr. George Phillips, aged fifty-nine years.

POTTER.—In Smithville, Tenn., on Sunday, October 23rd, Dr. Thomas J. Potter, aged sixty years.

PRIME.—In New York, on Monday, December 5th, Dr. William Reid Prime, aged sixty-four years.

QUIMBY.—In New York, on Sunday, November 6th, Dr. Charles Elihu Quimby, aged sixty-eight years.

RADOM.—In Bridgeport, Conn., on Saturday, December 3rd, Dr. Elizabeth L. Radom, aged twenty-nine years.

REYNOLDS.—In Glenolden, Pa., on Saturday, November 26th, Dr. John P. Reynolds, of Philadelphia, aged sixty-six years.

RICHARDSON.—In Heber Springs, Ark., on Wednesday, November 23rd, Dr. Foster G. Richardson, aged fifty-two years.

RICHARDSON.—In Philadelphia, Pa., on Saturday, November 19th, Dr. Bertha S. Hatfield Richardson, aged fifty-eight years.

ROCHE.—In San Francisco, Cal., on Friday, October 28th, Dr. Thomas B. Roche, aged forty-eight years.

ROSEWATER.—In Omaha, Neb., on Thursday, November 24th, Dr. Charles Rosewater, aged sixty-two years.

ROTHMAN.—In St. Louis, Mo., on Wednesday, November 23rd, Dr. Henry L. Rothman, aged thirty-two years.

RUFF.—In Philadelphia, Pa., on Thursday, November 17th, Dr. William F. Ruff, aged fifty years.

RUSS.—In St. Mary's, Pa., on Sunday, November 13th, Dr. Eban J. Russ, aged eighty-one years.

RUSSELL.—In Pueblo, Col., on Saturday, October 15th, Dr. Plummer D. Russell, aged fifty-one years.

SAMSON.—In San Pedro, Cal., on Saturday, November 19th, Dr. John F. Samson, aged eighty years.

SANDFORD.—In Durham, N. C., on Saturday, November 12th, Dr. John J. Sandford, of Creedmoor, aged fifty-seven years.

SCHENCK.—In Far Rockaway, N. Y., on Tuesday, November 6th, Dr. Garrett K. W. Schenck, aged forty-four years.

SHUEY.—In Oakland, Cal., on Wednesday, November 23rd, Dr. Sarah I. Shuey, aged seventy years.

SPIKES.—In Swartz, Ark., on Sunday, November 13th, Dr. Jesse M. Spikes, aged thirty-six years.

STEVENS.—In Waltham, Mass., on Wednesday, November 30th, Dr. Howard Theodore Stevens, aged forty-three years.

STEWART.—In St. Paul, Minn., on Friday, October 28th, Dr. Jacob Henry Stewart, aged seventy-one years.

STOCKWELL.—In Baton Rouge, La., on Wednesday, October 26th, Dr. John F. Stockwell, aged thirty-two years.

STONE.—In Corona, N. M., on Friday, November 18th, Dr. James Thomas Stone, aged forty years.

STAFFORD.—In Stockton, Ill., on Saturday, November 19th, Dr. Thomas J. Stafford, aged sixty-two years.

STRAUB.—In Philadelphia, Pa., on Monday, November 28th, Dr. D. Walter Straub, of Bethlehem, Pa., aged sixty-six years.

SUTHERLAND.—In Brodhead, Wis., on Friday, November 11th, Dr. Arick Sutherland, aged seventy-six years.

SWAN.—In Branford, Conn., on Thursday, December 1st, Dr. Charles Walter Swan, aged eighty-three years.

TALIAFERRO.—In Roanoke, Va., on Monday, November 21st, Dr. B. Lawrence Taliaferro, of Catawba, aged forty-four years.

TALLMADGE.—In Arkport, N. Y., on Tuesday, November 8th, Dr. Andnes M. Tallmudge, aged seventy-four years.

TAYLOR.—In Morganton, Va., on Saturday, November 26th, Dr. Isaac M. Taylor, aged sixty-four years.

THALER.—In Brooklyn, N. Y., on Sunday, November 13th, Dr. Moses M. Thaler, aged fifty-two years.

THOMPSON.—In Yakima, Wash., on Saturday, November 12th, Dr. James R. Thompson, aged forty-six years.

TOOLEY.—In Huntington, W. Va., on Friday, November 4th, Dr. George W. Tooley, aged sixty-two years.

VAN PEYMA.—In Buffalo, N. Y., on Wednesday, November 30th, Dr. Peter W. Pan Peyma, aged seventy-one years.

VEST.—In Dallas, Tex., on Monday, October 31st, Dr. David W. Vest, aged sixty-two years.

VINCENT.—In Chicago, Ill., on Wednesday, November 2nd, Dr. Mary Vincent, aged eighty-two years.

WALKER.—In Rochester, N. Y., on Tuesday, November 8th, Dr. Le Grand Allen Walker, aged fifty-six years.

WEILER.—In Delanco, N. J., on Thursday, November 24th, Dr. Harry K. Weiler, aged sixty-seven years.

WILKERSON.—In Memphis, Tenn., on Saturday, November 5th, Dr. Warren C. Wilkerson, aged ninety-three years.

WILLIAMS.—In Boston, Mass., on Tuesday, November 8th, Dr. Henry C. Williams, aged sixty-six years.

WRIGHT.—In Sacramento, Cal., on Thursday, November 24th, Dr. Henry E. Wright, aged seventy-five years.

YORK.—In Cincinnati, Ohio, on Thursday, November 3rd, Dr. James F. York, of Kenova, W. Va., aged fifty-five years.

YORKE.—In Jamaica Plain, Boston, Mass., on Wednesday, November 23rd, Dr. Albert Daniel Yorke, aged fifty-eight years.

LONDON LETTER.

*(From our own correspondent.)**Radium and Surgery—Increase in Cancer—Industrial Welfare Society.*

Professor Alexis Thomson in his opening lecture on surgery at the University of Edinburgh on October 5th last, discussed radiation. He pointed out that there was unanimous agreement in the medical profession that neither x rays nor radium could take the place of operation, and they were obliged to confess that operation was still the most important way of getting rid of malignant disease. Radiation completed the cure that operation might initiate, and now it was almost a routine for operation in such cases to be followed as soon as possible by the introduction of radium into the wound or by the subsequent exposure to x rays. He thought it was already possible to say that this routine was giving a larger percentage of cures. The second achievement of radiation was to convert an inoperable tumor into an operable one; but when putting radium into a tumor with a view to performing an operation at a later stage it was imperative that the operation be performed at the right time. The third advantage of x rays and radium was that they could palliate in hopeless cases; they could improve the condition of the patient by relieving pain although, unfortunately, in the early stages of malignant disease pain was usually absent, and many serious conditions thus escaped attention. For the most successful results in radiation the surgeon and radiologist should work together, and the medical profession must look to the cooperation of the radiologist and the surgeon for the best results in the future.

* * *

The medical officer of health for Edinburgh, Dr. Maxwell Williamson, who has previously called attention to the increase of cancer, returns to the subject in his report for 1920, issued recently. He says that the latest figures of cancer mortality are the highest ever recorded in Edinburgh. During the past twenty-three years the number of deaths in Edinburgh due to cancer has increased from 267 to 471. The deaths due to all forms of tuberculosis amounted to only 417. Cancer appears to be unaffected by environment, and is actually found, so far, at any rate, to be more frequent in better class districts, than in slums. Its commonest site seems to be the bowel, which, Dr. Williamson thinks, may suggest some influence exercised by present day habits of feeding.

* * *

At a conference of the Industrial Welfare Society held in London last June, Dr. R. M. Wilson introduced a discussion on the subject of medical service in industry, in which he said that the healthier the workman and the better his surroundings the more cheerful he was and the greater would be his actual output. If the doctors showed employers and employees that a particular thing, such as bad industrial conditions, was against the interests of both, they would remove the basis of their quarrel and raise disputes to another level. The fundamental doctrine of industrial medicine was that there was no disparity of interest between employer and employee,

what helped the one was bound to help the other. Doctors were not tradesmen; they were not there to make money; and it was an enormous advantage to have no stake or interest in the matter whatever.

Sir Ronald Ross, who had made many millions for capitalists, had opened the doors of the East to the British Empire, and who had made malarial countries habitable to the white man, had received nothing, relatively speaking. Yet, he, the speaker would not exchange the position of Ronald Ross for one of the capitalists who had made fortunes. Medicine was a kind of priesthood which asked for nothing but the benefit of humanity. For successful factory work in medicine they must have a general practitioner.

Dr. E. L. Collis, late director of welfare and health for the Ministry of Munitions, speaking on health problems in industry, said that he was convinced there was close connection between industrial unrest and public health. The medical profession had in their hands the foundation and the basis of the whole structure of civilization. He hoped that in seven or eight years time it would require the Albert Hall to hold a conference of medical men interested in health in industry. It was not enough for the doctors to wait until the individual in the factory was ill; they should keep him from being ill.

Dr. Holford E. Ross, certifying surgeon to the home office, advised more care of eyesight. He knew of one firm engaged in the printing of bank notes who saved several hundred pounds a year by employing an ophthalmic surgeon who came twice a week to examine the eyes of workers, and he found the eyes affected in about seven hundred workers. He suggested that the cost of a state industrial medical service should be shared equally by trade unions, employers, and the state. Dr. Cree, of a Newcastle firm of shipbuilders, said that he encouraged men to come to the ambulance room for the smallest injuries, and as a result sepsis had been entirely eliminated. This represented a great saving.

Dr. T. Lister Llewellyn, medical officer for the North Staffordshire Coal and Iron Masters' Association, told of a massage centre which he had equipped at the cost of £100, and at which two hundred cases a week were treated by two masseurs. It was difficult, he said, to express results in pounds, shillings and pence, but he calculated that even if one week's work were saved in each case treated the centre would be doing very well.

Mr. Seebohm Rowntree, the chocolate and cocoa manufacturer, said his firm had had fifteen years of experience of medical work in industry, and there was no question about its value. What was wanted was an educational campaign among employers, although it was practically impossible to prove to them under existing conditions that a medical service paid. There were so many different factors, and he could not say just how much a man's increased efficiency was due to medical service in his factory and how much to other causes. But the cost was extremely small in relation to the wages bill. His own firm had spent £2,000 a year, with a wages bill of £1,250,000. There was no capital outlay required, only three or four hundred pounds for a small consulting room and a few appliances.

Book Reviews

TREATMENT OF SYPHILIS.

Syphilis and Its Treatment. With Especial Reference to Syphilis of the Skin. By WILFRID S. FOX, M.A., M.D. B. C. (Cantab.), M. R. C. P. (Lond.), Physician for Diseases of the Skin, Lecturer on Dermatology, and Physician in Charge of the Venereal Department, etc. With Fifty-Three Illustrations, Twenty-two in Color on Fourteen Plates, and Thirty-one in Black and White on Twenty-eight Plates. New York: Paul B. Hoeber, 1921. Pp. viii-195.

The author has added another to the list of books on syphilis that have appeared within the past few years, without having anything in particular to commend it. The book under review is primarily concerned with syphilis as a skin disease, and is written from the viewpoint of the dermatologist. The reader is referred by the author to the textbooks on neurology, general medicine, and ophthalmology for a more complete description of the disease and its treatment as affecting the deeper organs.

The book is well adapted for the use of students; but it can hardly be said that it compares either in style or quality with some of its more recent predecessors, particularly of American authorship. It must be said in its behalf, however, that some of the illustrations are unusually good, though a few are mediocre. The work is simply another book on syphilis with little in it to praise and just as little to criticize. The student, taking up syphilis for the first time, will acquire a fair knowledge of the subject, and the practitioner who has kept up with the literature of syphilis will find in it what he already knows. Those who make a specialty of syphilis from the dermatological viewpoint may find the book valuable.

THE SPLEEN.

The Spleen and Some of Its Diseases. The Bradshaw Lecture of the Royal College of Surgeons of England for 1920. By Sir BERKELEY MOYNIHAN, Leeds. With Thirteen Full Page Diagrams. Philadelphia: W. B. Saunders Company, 1921.

The publishers have succeeded in producing a beautiful volume, thus complementing the excellent work of this well known surgeon. The author well emphasizes the fact that the part played by the spleen in surgery is only now being recognized, and with this comes a recognition of the etiology of diseases whose most conspicuous symptoms are evoked by associated or consecutive affections of other organs. In the provocation and development of morbid affections of the abdominal viscera, the spleen must be considered as an important factor.

The author takes up, with fascinating thoroughness, the anatomy and physiology of the spleen, quickly entering upon his discussion of the pathology of splenic diseases. He discusses in his customary brilliant style pernicious anemia, leucemia, Hodgkin's disease, and the less frequent aspects of splenic pathology. Though the work is highly technical and purely surgical in tone and motive, it is one that can be read with pleasure and profit by the medical internist, as well as by the practising surgeon.

OPERATIVE CYSTOSCOPY.

Handbuch der Cystoskopie. Von Dr. LEOPOLD CASPER, Universitäts Professor in Berlin. 4 Auflage, Mit 161 Abbildungen und 12 Tafeln in Vierfarbendruck. Leipzig: Georg Thieme, Verlag, 1921. Pp. 388.

The author takes pride in the fact that this edition has not required many changes in text from former editions, thus demonstrating that his past teachings were correct and have stood the test of time. New matter has been added, such as syphilis of the bladder, and various exanthemata of the vesical mucosa, such as herpes and purpura, which have been made visible by recent studies with the cystoscope. Particular attention is given in this new edition to the subject of operative cystoscopy, also made possible as a result of recent improvements in instrumental technic. There are twelve colored plates containing seventy-two illustrations of unusual excellence and beauty. Though there is an interesting chapter on intravesical photography, the author has not presented any of the photographs which have been taken by this procedure. The volume is an excellent one for the German reading surgeon, but does not differ materially from previous editions of the same work.

SURGICAL CLINICS.

The Surgical Clinics of North America. Chicago Number. Volume I, Number 4. August, 1921. Philadelphia and London: W. B. Saunders Company, 1921.

The current number of the *Surgical Clinics* maintains the usual high standard which these publications have established in the past. Chicago's best surgeons are found among the contributors. The *Clinics* cover a wide range and are exceedingly well presented from the viewpoint of the clinician as well as of the printer. For the general practitioner, and even for the busy surgeon, these *Clinics* constitute a valuable addition to his surgical reading.

MENINGOCOCCAL INFECTIONS.

L'Infection meningococcique. Par le Dr. CH. DOPTER, médecin principal de 1re classe; professeur à l'École de Val-de-Grace; membre de l'Académie de Médecine. Avec Ninety-seven figures dans le texte et two planches coloriées. Paris: Librairie J. B. Baillière et fils, 1921. Pp. 534.

This is one of the most comprehensive presentations of meningococcal infection, the subject being handled from every angle. An interesting historical sketch is followed by the epidemiology and etiology of the disease, and the various factors and causes are discussed. The author here as elsewhere has been quite catholic in his sources and presents the attitudes of the various schools. In the section dealing with the bacteriology we find many excellent plates, some in color, which should prove of value in the laboratory. Culture methods are also discussed at some length. The characteristics of the various meningococci and the differentiation from pseudomeningococcus is explained. Every phase of the clinical and anatomical consideration is gone into and if any part of this large work can be said to be best it would be the section devoted to the clinical

considerations of the disease. This takes us through the complications, diagnosis, and prognosis to treatment. The use of vaccines is handled with elaborate care leaving little for external reference. Anyone wishing to know all that modern medicine has to tell us about the meningococcal infections can find the information well given in this textbook.

ENCEPHALITIS LETHARGICA.

Epidemic Encephalitis (Encephalitis Lethargica). By FREDERICK TILNEY, M.D., Ph.D., Professor of Neurology, Columbia University; Attending Neurologist, the Presbyterian Hospital and the New York Neurological Institute, and HUBERT S. HOWE, A.M., M.D., Instructor in Neurology, Columbia University; Assistant Visiting Neurologist, the Presbyterian Hospital. Illustrated. New York: Paul B. Hoeber, 1920. Pp. xv-252.

Much literature has appeared regarding encephalitis lethargica, yet few investigators have ventured to present their findings in book form. This monograph covers the clinical, etiological and pathological phases of the disease with as much thoroughness as can be expected in the light of present day knowledge. Many cases are cited and the illustrations help to clarify the text. A short, yet comprehensive bibliography is appended. As the disease is one that is now frequently encountered and one that heretofore was almost a rarity, this brochure should prove useful to the practitioner.

PSYCHOLOGY OF CHILD BEHAVIOR.

Aspects of Child Life and Education. By G. STANLEY HALL and Some of His Pupils. New York and London: D. Appleton & Co., 1921. Pp. xiii-326.

Many extremes are presented in this book which contains papers by Hall and his collaborators, from intimate personal subjective self-analysis of the child life of some of the contributors to sketchy, yet laborious laboratorylike methods presented by others. The book is useful and it is not difficult to reconcile the many methods of study which it presents. On the whole it may be said to follow more closely the historical method. Healthy conclusions are presented, yet little search is made for the psychological causes and conditionings underlying the behavior of children.

Hall contributes a chapter on the Contents of Children's Minds. This is based on some rather extensive work done in Germany, some observations of his own in Boston, and the report of educators in Kansas. The laboratory method is followed. The need for giving children better information about the more commonplace things is clearly shown. The chapter on the Psychology of Daydreams does not cover the subject in any way, for the cause and mechanism of this phenomenon is carefully avoided. The symbolism is not explored, nor is it shown that the wishfulfillment mechanism and the suppressions are at the root of the condition. There are other chapters on Curiosity and Interest, a Study of Dolls, the Collecting Instinct, the Psychology of Ownership (which could have been presented more fundamentally), Fetishism in Children, and a closing chapter by Hall on Boy Life in a Massachusetts Country Town Forty Years Ago. This is told in an interesting way and shows how a healthy, constructive and extroverted life was led and encouraged under this semiprimitive, yet extremely natural environment.

THE DAWN OF ADOLESCENCE.

A Young Girl's Diary. Prefaced with a Letter by SIGMUND FREUD. Translated by EDEN and CEDAR PAUL. New York: Thomas Seltzer, 1921. Pp. 285.

Even without Freud's warm recommendation, this book would attract attention. Much is being written and read in these days on adolescent psychology, and there is still greater need for study of the period of preadolescence. Unconsciously the writer of this diary has given us a textbook of paramount value. The little Austrian girl records her true feelings and thoughts frankly from the ages of eleven to fourteen and a half, the years of hesitation at the brink of puberty. Without guidance of any sort the child and her chum grope their way into adolescence, observing, looking for explanations, fearful, yet inevitably fascinated by the shroud of mystery concealing sex, marriage, realities of every sort. They pass through these years, joyous children, growing up, seeking guiltily, but constantly for facts, storing up experience. The mental growth attained in the process is beautiful to follow. The family circles of these two friends, their school and holiday surroundings, all the environmental factors of their development, are so skilfully drawn that each character stands out independently and clearly by virtue of deft touches inconspicuously given. The relations described of mother to daughter, of daughter to father, of sister to brother, are universal, normal, and therefore alive with possibilities.

The book is especially timely as a plea for sex education. The physician is constantly called upon to advise concerning conditions growing out of the eras of suppression, some of the results of which are only too clearly pictured in the book. His recommendation of this diary to the many mothers who may have forgotten their own gropings will help in the necessary adjustments. Every adult who believes that his or her experiences in passing through these years are individual, perhaps abnormal, will learn and regain kinship with an eager young mind.

A HISTORY OF PSYCHOLOGY.

A History of Psychology. By GEORGE SIDNEY BRETT, M.A. (Oxon.), Professor of Philosophy in the University of Toronto. Volume II: Medieval and Early Modern Period. Pp. 394. Volume III: Modern Psychology. Pp. 322. London: George Allen & Unwin, Ltd. New York: The Macmillan Company, 1921.

Psychology has many ramifications. Important to the physician are the bearings it has on psychiatry and human behavior generally. More and more have we come to realize that many diseases, functional and organic, have a decided relationship to psychology. Happiness has long been known to be a hand-maiden to health, yet we all know that a proper understanding of psychological processes is more needful as a foundation to happiness than all the drugs in the pharmacopœia. In the early days of modern medicine too little stress was placed on the knowledge and state of the patient's mind and too much on the state of his liver or some other obscure appendage. For these reasons it is incumbent upon the physician of today to know more about psychology. Until recently, as this history shows, psychology was considered more within the domain of scholastic thinkers, or perhaps talkers would be more

appropriate. James and a few other more progressive workers did much to correlate philosophy, psychology and medicine. In this work of Brett's we are given a fair résumé of the growth of psychology. It is more than a straightforward statement of the evolution of psychology as a science, for Brett brings in his own ideas as to the bearing each school, or rather each set of followers of a certain philosopher, exerted on the study and growth of philosophy. It is natural that a work of this kind should show bias, yet conservatism is shown throughout and room is left for individual interpretation. To know man we must know psychology and psychological processes. To know these we should know the history of science and its development. These are fully covered in Brett's history.

PSYCHOPATHOLOGY OF ONANISM.

Autoerotic Phenomena in Adolescence. An Analytical Study of the Psychology and Psychopathology of Onanism. By K. MENZIES. With a Foreword by Dr. ERNEST JONES. Second Edition. New York: Paul B. Hoeber, 1921. Pp. viii-100.

The first edition of this extremely useful little book was reviewed in these columns when it first appeared. A favorable reception necessitated a second edition. The views presented do not agree with those held by the old fashioned practitioner—fortunately. New light is shed upon what has heretofore been considered taboo. Masturbation in the light of the new psychology is no longer considered as a perversion but rather as an evolutionary transition, being normally related to the autoerotic period. It can only be stated if it persists that certain infantile characteristics have been retained, that the organism has not developed to a state of psychic maturity. Many lives have been made miserable by well meaning but stolidly ignorant physicians by remarks they have made to their patients when consulted in regard to this problem. Many cases of neurosis and impotence have resulted from their carelessness. At any rate, physicians would do well to acquaint themselves with the underlying mechanisms as set forth in this book.

MIRROR SUPERSTITIONS.

Spiegelzauber. By Dr. GÉZA RÓHEIM. Internationale Psychoanalytische Bibliothek, Nr. 6. Internationaler Psychoanalytischer Verlag, Leipzig and Vienna, 1919. Pp. 263.

This book is a welcome addition to the growing library of psychoanalytical publications. It is an important study of a group of folk superstitions occupying an important place in human society. It is also an exceptionally clear presentation of the value of the individual psychology of psychoanalysis as a starting point for the understanding of such a group of superstitious beliefs and customs. The application of the principles of psychic development discovered by psychoanalysis is made with a striking directness. The writer has a mass of material at his command and his point of view is particularly clear concerning its relation to individual psychic development, for he believes that all this material dealing with the beliefs and customs, not excluding the taboos and evidences of fear which surround the use of mirrors or other reflecting surfaces, has its origin in one of the three important phases of libido

development in the individual. This is the narcissistic stage following upon the earlier autoerotic period of development and preceding that of the turning out of the libido to object love. It is natural that many such superstitions as these associated with the mirror should cluster about children, since childhood is the period when the individual passes through the narcissistic period. The many phantasies, however, which extend in other directions, show clearly enough that the narcissistic stage is not completely left behind with childhood. There is the tendency of the unconscious to hold fast this early realization of the value of the self as a distinct thing, and the need on the other hand for the growing personality to find other objects for itself in the external world, resulting in these often apparently contradictory manifestations of the mirror phantasies which express both sides of the desire, and in the taboos and the fears they evidence the conflict which the opposing tendencies engender.

The common use of the mirror in foretelling future events reveals the infantile tendency to objectivation of the inner impulses. It represents sometimes the image of the ego, a second self, or in some instances it is an objectivation of the peeping instinct of the child preserved in the unconscious under repression. The bedecking of a ruler with mirrors further illustrates this preservation of the infantile selflove, since the ruler represents the narcissistic conception of omnipotence of the self. The many customs relating to the discovery of the future mate, or otherwise associated with love, show plainly that love of an object outside of the self has as its basis the love of oneself. There is evidence here of the varying success which attends the transference over to the love object. If the narcissistic attitude has become a fixation the object discovered in the mirror will take a negative form, a threat of death or other symbol of the regression.

There is evidence of the use of animals as transfer objects of the self, representing probably a phylogenetically closer relation between man and beast, as well as sometimes a symbolic regressive expression of the peeping instinct. The prohibitions which pertain in great number to the looking into a mirror or the use of mirrors to guard the human being from demons give the negative form of the unconscious interest, its repression, or, as the author says, speaking ethnologically, its taboo. This negative phase is evident also in the superstitions which centre about the breaking of a mirror and which make it essential to cover the mirror from the dead or dying. The writer gives an interesting chapter upon the relation of the mirror and the heavenly bodies.

The book is well worth close study for the applying of the illuminating principles of individualistic psychology to these questions of folklore and mythology. Its reading would well repay the worker who is seeking for analogies to the phobias and other evidences of the narcissistic selflove, and the peeping instinct associated so closely with it, which are found in individual analysis of the unconscious. The detail of material as well as the writer's suggestive interpretations throw much light upon this phase of psychic development, whether in its progressive or regressive form.

RANDOM NOTES ON THE WEST INDIES.

Roaming Through the West Indies. By HARRY A. FRANCK, Author of *A Vagabond Journey Around the World*, *Zone Policeman 88*, *Vagabonding Down the Andes*, etc. Illustrated with Photographs by the Author. New York: The Century Company, 1921. Pp. xiv-186.

The very manner of the book, "random pickings" as the writer calls his matter, brings in its human simplicity a new realization of a good many facts. One finds anew and with many an informing point of interest the great though confused drama of the history of these islands. One note that the author strikes reminds the reader of the great body of aborigines who were long ago practically removed from the history of the islands they once exclusively inhabited. Then there is the long story of misrule, high development in some respects but at the expense of the establishment of an autocracy based upon the importation and exploitation of African slaves. Not so deplorable, however, has been the outcome of the question of color lines, with all its gradations, as has been the lack of self-restraint and selfcultivation among the masses of the people who have attained the opportunity, without the ability, to govern themselves. Leaders there are and men of high culture, but they have not the staunchness to cope with the situations which demand a quality of unselfish service which the island conditions have not been fitted to inculcate.

The chapters describing conditions in Porto Rico are one long conscience stirring plea against the economic burden of oppression under which the inhabitants are groaning since our occupation and against the hollowness of any pretensions to real development of the island. These, our many neighbors scattered about on the islands at the foot of our land, are human beings. This book brings nearer to us these lands in all their rare beauty and luxuriant natural wealth. It also brings the peoples themselves closer to our sense of responsibility to exercise upon them some practical policy guided by intelligent understanding of them and their needs.

THE STORY OF A PIKE.

Grim: The Story of a Pike. Translated from the Danish of Svend Fleuron by JESSIE MUIR and W. EMMÉ. Illustrated by DOROTHY P. LATHROP. New York: Alfred A. Knopf, 1921.

The insect world has had friendly spokesmen in Fabre, Maeterlinck, and many others who were moved to expression by the busy selfsufficiency of insect life. Now the fish has come into her own. The life history of Grim is the dramatic struggle for survival in the water. Eat or be eaten pertains here as everywhere else, and Grim's life is one long meal. She steers clear of indigestion to a mythical age and encompasses in her career every possible and plausible fishhood experience.

The quality of this book is in its sure simplicity. The ever changing beauty of marsh and lake, the teeming life on all sides, a scientific treatise on flora and fauna of the locality are transcended by a poet's touch. The beauty of reality is pictured without fantastic variations, life in and around the waters proving as absorbing and colorful as human activities.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE HEART, OLD AND NEW VIEWS. By H. L. FLINT, M. D. New York: Paul B. Hoeber, 1921. Pp. xii-177.

THE EDUCATION OF BEHAVIOR. By I. B. SAXBY. London: University of London Press, Ltd., 1921. Pp. vii-248.

EXAMEN DES ALIENES. Nouvelles Methodes Biologiques et Cliniques. Par ANDRÉ BARBÉ. Paris: Masson & Cie, 1921. Pp. xv-178.

THREE GOLDEN DAYS. Tanbark Tales. By WILLIAM S. WALKLEY. New York: Fleming H. Revell Company, 1921. Pp. 168.

INSANITY IN EVERYDAY PRACTICE. By E. G. YOUNGER, M. D. Fourth Edition (Reprinted). London: Baillière, Tindall and Cox, 1919. Pp. x-134.

SEXUAL PSYCHOLOGIE. Von Dr. Med. HERMANN ROHLEDER. Banden I und II. Monographien Zur Sexualwissenschaft. Hamburg: Paul Hartung, Verlag, 1921.

DISEASES OF THE NERVOUS SYSTEM. By H. CAMPBELL THOMSON, M. D. Third Edition, Revised. New York: Paul B. Hoeber, 1921. Pp. xvii-566.

MEDICAL EXAMINATION FOR LIFE INSURANCE. By THOMAS D. LISTER. London: Edward Arnold & Co. New York: Longmans, Green & Co., 1921. Pp. viii-168.

STUDIES IN THE PALÆOPATHOLOGY OF EGYPT. By SIR MARC ARMAND RUFFER. Edited by ROY L. MOODIE, Ph. D. Chicago: The University of Chicago Press, 1921. Pp. xx-372.

THE GREATEST AMERICAN: ALEXANDER HAMILTON. By ARTHUR HENDRICK VANDENBURG. Illustrated. New York and London: G. P. Putnam's Sons, 1921. Pp. xx-353.

A MANUAL OF PHARMACOLOGY. By WALTER E. DIXON. Fifth Edition, Completely Revised. London: Edward Arnold & Co., 1921. New York: Longmans, Green & Co., 1921. Pp. xii-468.

THE WHITEHEADED BOY. A Comedy in Three Acts. By LENNOX ROBINSON. With an Introduction by ERNEST BOYD. New York and London: G. P. Putnam's Sons, 1921. Pp. xviii-169.

THE ORIGIN AND DEVELOPMENT OF THE NERVOUS SYSTEM. From a Physiological Viewpoint. By CHARLES MANNING CHILD. Chicago: The University of Chicago Press, 1921. Pp. xvii-296.

ROMAIN ROLLAND. The Man and His Work. By STEFAN ZWEIG. Translated from the Original Manuscript by EDEN and CEDAR PAUL. New York: Thomas Seltzer, 1921. Pp. x-377.

MIKROMETHODIK. Quantitative Bestimmung der Harn- und Blutbestandteile in kleinen Mengen für klinische und experimentelle Zwecke. Leipzig: Georg Thieme, Verlag, 1921. Pp. 116.

THE DISEASES OF CHILDREN. By the Late Sir JAMES FREDERIC GOODHART, Bart., M. D. Eleventh Edition. Edited by GEORGE FREDERIC STILL. New York: Paul B. Hoeber, 1921. Pp. xv-942.

MENTAL DISEASES. A Textbook of Psychiatry for Medical Students and Practitioners. By R. H. COLE, M. D. Second Edition. Fully Revised with New Illustrations. London: University of London Press, Ltd., 1919. Pp. xii-351.

A TREATISE ON DISEASES OF THE SKIN FOR ADVANCED STUDENTS AND PRACTITIONERS. By HENRY W. STELWAGON, M. D. Ninth Edition, with the Assistance of Henry Kennedy Gaskill, M. D. Philadelphia and London: W. B. Saunders Company, 1921. Pp. 1,313.

PEOPLE OF AFRICA. By EDITH A. HOW, B. A. New York: The Macmillan Company, 1921. Pp. vi-64.

AUTUMN. By ROBERT NATHAN. New York: Robert M. McBride & Company, 1921. Pp. 198.

A THIRD OF LIFE. By PERRITON MAXWELL. Boston: Small, Maynard & Co., 1921. Pp. 304.

WOMAN FROM BONDAGE TO FREEDOM. By RALCY HUSTED BELL. New York: The Critic and Guide Company, 1921. Pp. xv-230.

FORTY-THIRD ANNUAL REPORT OF THE DEPARTMENT OF HEALTH OF THE STATE OF NEW JERSEY, 1920. Trenton: MacCrellish & Quigley Co., 1921. Pp. 381.

THE PHYSICAL PROPERTIES OF COLLOIDAL SOLUTIONS. By E. F. BURTON. Second Edition. New York: Longmans, Green & Co., 1921. Pp. viii-221.

WHAT TO DO IN CASES OF POISONING. By WILLIAM MURRELL, M. D. Twelfth Edition, Revised by P. HAMILL, M. D. New York: Paul B. Hoeber, 1921. Pp. 273.

FESTSKRIFT TILLAGNAD, Professor J. AUG. HAMMAR, Pa Hans 60-Ars Dag Den 21 August, 1921. Upsala: Almqvist & Wiksells Boktrycker i-A.-B., 1921.

THE MORPHOLOGICAL ASPECT OF INTELLIGENCE. By SANTE NACCARATI. Edited by R. S. WOODWORTH. London and Paris: G. E. Stechert & Co., 1921. Pp. 44.

COLLECTED PAPERS ON THE PSYCHOLOGY OF PHANTASY. By Dr. CONSTANCE E. LONG. New York: Moffat, Yard & Company, 1921. Pp. xii-216.

TWO DISCOURSES DEALING WITH MEDICAL EDUCATION IN EARLY NEW YORK. By SAMUEL BARD, M. D. New York: Columbia University Press, 1921. Pp. iii-28.

OPERATIVE DENTAL SURGERY. By J. B. PARFITT, L. R. C. P., M. R. C. S., L. D. S. London: Edward Arnold & Co.; New York: Longmans, Green & Co., 1921. Pp. 319.

UROLOGIE DES PRAKTISCHEN ARZTES. Von Hofrat Dr. FELIX SCHLAGINTWEIT, Chirurg für Harnkrankheiten in München. Mit thirty-nine Abbildungen. München: J. F. Lehmanns, 1921. Pp. 135.

THE NOVELS OF IVAN TURGENEV. The Two Friends and Other Stories. Translated from the Russian by CONSTANCE GARNETT. New York: The Macmillan Company. London: William Heinemann, 1921. Pp. 369.

PROSTITUTION IN THE UNITED STATES. Volume I—Prior to the Entrance of the United States into the World War. By HOWARD B. WOOLSTON, Ph. D. New York: The Century Company, 1921. Pp. xiii-351.

ELEMENTS DE PHYSIOLOGIE HUMAINE A L'USAGE DES ETUDIANTS EN MEDECINE. Par LEON FREDERICO et J. P. NUEL. Septieme Edition. Liege: H. Vaillant-Carmanne. Paris: Masson et Cie, 1920. Pp. xxiii-624.

THE PRACTICAL MEDICINE SERIES FOR 1921. Volume III: The Eye, Ear, Nose and Throat. Edited by CASEY A. WOOD, ALBERT H. ANDREWS, and GEORGE E. SHAMBAUGH. Chicago: The Year Book Publishers, 1921. Pp. 392.

THE CLINICAL EXAMINATION OF THE NERVOUS SYSTEM. By G. H. MONRAD-KROHN, M. D. (Christiania), M. R. C. P. (Lond.), M. R. C. S. (Eng.). With a Foreword by T. Grainger Stewart, M. D., F. R. C. P. London: H. K. Lewis & Co., Ltd., 1921. Pp. xv-135.

TUBERKULOSE-BIBLIOTHEK. Beihefte zur Zeitschrift für Tuberkulose, herausgegeben von Prof. Dr. LYDIA RABINOWITSCH. Nr. 2. Die Lungentuberkulose im Röntgenbilde. Von Dr. MAX COHN. Mit ten Textabbildungen und 3 Tafeln. Leipzig: Verlag von Johan Ambrosius Barth, 1921. Pp. 48.

ANLEITUNG UND INDIKATIONEN FÜR BESTRAHLUNGEN MIT DER QUARZLAMPE "KUNSTLICHE HOHENSONNE." Von Geh. Sanitätsrat Dr. HUGO BACH, Bad Elster i. Sachsen unter Mitarbeit von Dr. OSKAR DAVID, und Dr. FERDINAND ROHR, Dr. HANS WAUBKE, Dr. JOHANNES KEUTEL. Mit sixteen Abbildungen im Text. Siebente und achte ungearbeitete und vermehrte Auflage. Leipzig: Verlage von Curt Kabitzsch, 1921. Pp. vii-160.

DANGEROUS AGES. By ROSE MACAULEY. New York: Boni & Liveright, 1921. Pp. 242.

THE GLORIOUS HOPE. By JANE BURR. New York: Thomas Seltzer, 1921. Pp. 272.

THE GRAND STRATEGY OF EVOLUTION. By WILLIAM PATTEN. Boston: Richard G. Badger, 1920. Pp. xviii-430.

PSYCHOLOGY, A STUDY OF MENTAL LIFE. By ROBERT S. WOODWORTH. New York: Henry Holt & Company, 1921. Pp. x-580.

THE PRINCIPLES OF MEDICAL TREATMENT. By GEORGE CHEEVER SHATTUCK. Fifth Revised Edition. Boston: W. M. Leonard, Inc., 1921. Pp. 309.

SELFDVELOPMENT. A Handbook for the Ambitious. By H. ADDINGTON BRUCE. New York and London: Funk & Wagnalls Company, 1921. Pp. x-332.

DISEASES OF THE SKIN. By RICHARD L. SUTTON, M. D. Fourth Edition, Revised and Enlarged. St. Louis: C. V. Mosby Company, 1921. Pp. 1,132.

AUGUST STRINDBERG. A Psychoanalytic Study with Special Reference to the (Edipus Complex). By AXEL JOHAN UPPVALL. Boston: Richard G. Badger, 1920.

ALICE ADAMS. By BOOTH TARKINGTON. Illustrated by ARTHUR WILLIAM BROWN. Garden City, N. Y., and Toronto: Doubleday, Page & Company, 1921. Pp. 434.

DIAGNOSTIC CARDIOLOGIQUE. Par le Dr. SCHRUMPF-PIERON, Paris. Preface de M. le Professeur H. VAQUEZ. Paris: Librairie J. B. Baillière et Fils, 1921. Pp. 308.

THE PRACTICAL MEDICINE SERIES FOR 1921. Volume II. General Surgery. Edited by ALBERT J. OCHSNER, M. D. Chicago: The Year Book Publishers, 1921. Pp. 625.

BISMARCK, NIETZSCHE, SCHEFFEL, MORIKE. Der Einfluss nervöser Zustände auf ihr Leben und Schaffen. Von Dr. med. A. MULLER. Bonn: A. Marcus & E. Webers Verlag. Pp. v-102.

AN INTRODUCTION TO THE HISTORY OF MEDICINE. By FIELDING H. GARRISON. Third Edition, Revised and Enlarged. Philadelphia and London: W. B. Saunders Company, 1921. Pp. 942.

THE BLOOD SUPPLY TO THE HEART IN ITS ANATOMICAL AND CLINICAL ASPECTS. By LOUIS GROSS. With an Introduction by HORST OERTEL. New York: Paul B. Hoeber, 1921. Pp. xvi-171.

PSYCHOANALYSIS AND ITS PLACE IN LIFE. By M. K. BRADBY. Second Impression. London: Henry Frowde, Hodder & Stoughton, Ltd. New York: Oxford University Press, 1920. Pp. xi-266.

LA SIFILIDE EREDITARIA E ACQUISITA IN RAPPORTO ALLE MALATTIE DEL CORPO UMANO. Par il Dott. PASQUALE FUSCO. Volume III. Philadelphia: The Latin Printing Company, 1921. Pp. 413.

THE SWORN BROTHERS. A Tale of the Early Days of Iceland. Translated from the Danish of GUNNAR GUNNARSSON by C. FELD and W. EMÉ. New York: Alfred A. Knopf, 1921. Pp. 340.

TWELVE ESSAYS ON SEX AND PSYCHOANALYSIS. By WILHELM STEKEL. Translated and Edited by S. A. TANNENBAUM, M. D., New York. New York: The Critic and Guide Company, 1922. Pp. 320.

A TEXTBOOK OF SURGICAL ANATOMY. By WILLIAM FRANCIS CAMPBELL. Third Edition, Revised, with 325 Original Illustrations. Philadelphia and London: W. B. Saunders Company, 1921. Pp. 681.

PROSTHETIC DENTISTRY. A Textbook on the Chair Side Work for Producing Plate Dentures. By DOUGLAS GABELL, L. R. C. P., M. R. C. S., L. D. S. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1921. Pp. xii-237.

ON THE TRAIL OF THE PIGMIES. By Dr. LEONARD JOHN VANDENBERGH, J. D., LL. B. Photographic work under the guidance of Dr. GEORGE BURBANK SHATTUCK. Foreword by ROBERT H. LOWIE. New York: James A. McCann Company, 1921. Pp. xiv-264.

Practical Therapeutics

LOCATING FOREIGN BODIES IN FINGERS AND TOES.

BY DAVID LAZARUS, M. D.,
New York.

One night I was called upon to examine the finger of a seamstress for the presence of a needle which had accidentally thrust itself into her finger and she believed it had been broken in her attempts at removing it. Not being able to obtain an x ray examination at that hour it occurred to me to use the principle of the x ray and I therefore looked at the finger with my pocket flash light applied under the injured member and was able to obtain a very clear and distinct picture which showed no presence of any foreign substance.

By this simple means the presence and extent of a necrotic area of bone in the digits of the hand or foot may be determined. The process is not to replace x ray examinations, which should always be done when possible, but is given only as a rapid and useful aid in office work.

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Acute Glaucoma.—A. Cantonnet (*Paris médicale*, September 3, 1921) notes that, in order to avoid the risks attending abrupt decompression as a result of iridectomy in acute glaucoma, puncture of the anterior chamber a short while before beginning the iridectomy is generally recommended in textbooks. To this procedure, however, he prefers the drop by drop instillation of pilocarpine. As soon as the diagnosis of acute or subacute glaucoma has been made, the patient lies down and one drop of two per cent. pilocarpine nitrate solution is instilled with the lower lid drawn downward and the patient looking upward. The lid being held down, the pilocarpine is allowed to act for half a minute and another drop then added. This procedure is continued for ten minutes, a half hour interval allowed, and the drops then instilled for ten minutes more. This treatment is continued for half a day or the entire day, as required. On subsequent days, if the intraocular tension has diminished—as is the rule—the series of instillations are made shorter and repeated at longer intervals. By this means a considerable lowering of tension is obtained in the acute and subacute cases and one can operate without fear of sudden decompression and with greatly improved results. The same procedure may be followed where the patient cannot be promptly referred to a specialist. The prognosis in acute glaucoma is good when iridectomy is done early. The visual acuity is seldom restored to normal but frequently reaches five or six tenths, which is a satisfactory result in eyes reduced to indistinct light perception during the acute attack. A point to be borne in mind in the general treatment of glaucoma is that these patients nearly always show an impairment of the power to excrete chlorides.

The Treatment of Tuberculous Adenitis by Röntgen Rays and Radium.—Russell H. Boggs (*American Journal of the Medical Sciences*, July, 1921) asserts that radium and röntgen rays will cure more cases of tuberculous adenitis than any other method, while surgical treatment is always contraindicated primarily. Hard fibrous nodules following radiotherapy seldom contain any tuberculous foci, and it may be advisable to remove these nodules through an incision. Large cervical glands may be due to sarcoma, Hodgkin's disease, or leucemia. Radiotherapy is still the best form of treatment for multiple glandular tumors, but the end results are not the same as when the enlargements are due to tuberculosis.

Röntgen Therapy in Gynecology.—Claes Carlström (*Hygiea*, July 31, 1921) reports results of x ray treatment in such gynecological conditions as fibromyoma of the uterus, bleedings of the menopause without tumor, ovarian cancer and dysmenorrhea—all from the gynecological clinic at Upsala. The fibromyomata showed good results in half the cases, less so in the remainder. Climacteric bleedings without tumor were all benefited, as was also a case of ovarian cancer, but in a case of dysmenorrhea there was no improvement. Moderate doses were used and the treatment extended over quite a period, in some as long as eight months. Attention is called to the need of careful doses, as ovarian cells are especially sensitive to x rays and artificial menopause is too readily induced by strong doses. Mention is also made of good results in cases of pruritus vulvæ, cancer uteri and cancer vulvæ. The author's experience strengthens his conviction that x ray therapy is valuable in gynecology.

Treatment of Acute Follicular Tonsillitis.—Walter W. Griffin (*Medical Record*, September 3, 1921) advises the early administration of a large dose of castor oil to produce free catharsis, and capsules of quinine bisulphate, salol and acetphenetidin to produce free diaphoresis. These measures increase the elimination of toxins while frequent gargling with a mild alkaline antiseptic will hasten the rupture of the crypts. In the stage of eruption the main endeavor should be to promote drainage from the follicles and to antisepticize them. For this purpose an antiseptic gargle without astringent properties should be used, and also applications of strong colloidal silver solutions to the tonsils and even within the crypts. In this stage, as long as pressure on the tonsil will squeeze out pus from the crypts, no astringent gargles should be used, as they shrink up the openings and dam back the pus. Many cases of quinsy have been due to too early administration of such astringent gargles. After the spots have left the tonsils, we are ready for the astringent gargle, and the best probably consists of two drams of the tincture of the chloride of iron to one ounce of glycerin, of which mixture a dram added to a half glass of water used every two hours will rapidly bring the tonsil back to normal size.

Treatment of Carcinoma of the Tongue.—Douglas Quick (*Annals of Surgery*, June, 1921, says that the primary lesion in cancer of the tongue should be managed entirely by the use of radium. The use of buried emanation in weak tubes uniformly distributed throughout the growth is the method of choice in applying the radium. The cervical nodes should be treated conservatively: First, by external radiation where the neck is free from palpable involvement, and then, should metastases appear, the treatment of these should be by external radiation, followed by a complete neck dissection under local anesthesia, coupled with the use of radium emanation in very weak tubes buried throughout the wound. While the time factor is still too short to permit of comparison with surgical statistics, it is believed that this form of treatment in unselected cases will yield a higher percentage of clinical cures than will surgery alone in the selected operable group.

Autoserotherapy in Malignant Tumors.—H. Gaudier (*Bulletin de l'Académie de médecine*, July 12, 1921) tried this treatment in twenty-four cases, comprising eight of ulcerated epithelioma of the tongue, six of ulcerated epithelioma of the pharynx, four of epithelioma of the nasal cavities and sinuses, three of epithelioma of the breast, one of epithelioma of scalp, and two of intracranial sarcoma. Subcutaneous injection of the patient's serum was found more effective and less irksome than intravenous administration. The serum from twenty mils of blood collected the preceding day and kept at room temperature is given at a dose. The injections are repeated at three day intervals until twenty doses have been given, the average amount of serum being ten mils. The therapeutic results obtained consisted of reduction in the size of the tumor, diminution of ulceration and of glandular enlargements, cessation of pain, and improvement in the general condition. Aside from the sedative effect, which in some instances sets in after the initial injection, the other results are obtained gradually. One of the earliest effects is the improvement in the general health, which is frequently noticeable after four or five injections. Cachectic and debilitated patients, often confined to bed, or at least compelled to give up their ordinary occupations, are enabled to resume their ordinary activities and mode of life.

Misuse of Autogenous Vaccines.—C. E. Jenkins (*Practitioner*, August, 1921) says that recurrent acute catarrh of the upper respiratory passages is much the commonest minor malady which is treated by vaccines. The sufferers from this complaint can be divided into two main groups, the first being probably the smaller. In this the patients have a permanent chronic catarrh of varying intensity, and are subject to periodical acute exacerbations, usually brought on by climatic change or exposure. An autogenous vaccine is the correct type to use for these cases, because the condition is always present and the vaccine is required for curative purposes. The second and larger group comprises those persons who are usually free from any sign of catarrh, but who invariably catch cold if brought into contact with anyone suffering from acute catarrh.

An autogenous vaccine is frequently prepared for these patients. The time chosen at which to obtain the specimen for culture is during the height of an attack, or, at any rate, as soon after the acute stage as possible. In these circumstances the causal organism can usually be isolated, but it is important to keep in view two facts. First, the organism is the causal one of that particular attack; it affords no proof that future attacks will be caused by the same organism. The second point is that the vaccine will be used for prophylaxis; that is to say, to prevent the patient contracting another attack in the future.

It may be conceded that if the patient should again be brought into contact with a case of catarrh due to the same organism, his resistance would be greater after a course of vaccine treatment. But if the vaccine is expected to confer an immunity against acute nasal catarrh in general, and wherever he may be exposed to infection, there follows of necessity the assumption that acute catarrh of the upper respiratory passages is always due to the same organism. Such an hypothesis is manifestly absurd, for it is an established fact that the identity of the predominant organism varies in different epidemics and even in the same epidemic in different parts of the country.

Autogenous Vaccine Therapy in Staphylococcic Septicemia.—Buc and Jacquelin (*Paris médical*, August 27, 1921) report two cases of staphylococcemia exhibiting an abrupt onset and persisting for two and two and a half months, respectively, with a continuously irregular temperature. Both patients showed emaciation, to the point of distinct muscular atrophy. The skin, instead of being dry as in other infections, was fatty and waxy, and the tongue showed a thick brown coat. In one instance the onset, apart from its abruptness, suggested typhoid fever, and the diagnosis was made only by the agglutination test and blood culture. Autogenous vaccine treatment had but little effect on the general septicemic manifestations, but yielded marked results as regards the local purulent staphylococcic foci. Whereas some of the earlier complicating foci had even threatened life, those following the institution of vaccine treatment were very mild. All the local suppurations were permanently relieved by simple puncture, although the staphylococcus aureus was abundantly present. Recovery was comparatively rapid, considering the usual obstinacy of staphylococcic infections. The results were, in general, comparable to those obtained by vaccine treatment in osteomyelitis.

Pernicious Anemia and Its Treatment by Homohemotherapy.—B. M. Edlavitch (*Journal of the Indiana State Medical Association*, June, 1921) says that repeated injections of small amounts of blood apparently are of greater benefit, are safer, and are more easily given than single large injections. The reaction that sometimes follows may be due to changes in the blood platelets; associated early coagulative changes in the blood; possible injury to the red cells, or to unknown changes in the blood whereby it becomes essentially a foreign protein. Preliminary subcutaneous injection of suprarenalin or adrenalin chloride is of value in the prevention of such reactions, and its use as a prophylactic is urged.

Treatment of the Parkinsonian State in Lethargic Encephalitis.—Paulian and Bagdasar (*Presse médicale*, September 7, 1921) refer to the excitomotor and painful form of lethargic encephalitis, attended, e. g., with rhythmic movements of the lower jaw, alternate flexion and extension of the foot, alternate pronation and supination of the forearm, lateral movements of the buccal commissure, and general Parkinsonian tremor of the extremities. The subjective distress attending these movements was found markedly relieved in five cases by injections of 0.25 milligram of scopolamine hydrobromide. Occasionally a dose exceeding 0.5 milligram in twenty-fours was employed, without any untoward result. The effects of the drug appeared in twenty to thirty minutes, and consisted of subjective relief, complete cessation of tremor and rhythmic movements, a slight diminution of rigidity, reduction of blood pressure, increase of muscular strength, and decrease or even disappearance of the salivary secretion. No toxic effect or vasomotor disturbance was observed.

Treatment of Tetanus.—S. O. Freedlander (*American Journal of the Medical Sciences*, June, 1921) reports four cases of tetanus in which the patients recovered after the following routine treatment. Antitoxin intravenously in doses of ten to twenty thousand units, several times daily until all spasm is gone; morphine hypodermically and chloretone by rectum every four to six hours during the stage of reflex excitability, and liquid nourishment with large amounts of water every two hours. While it is the general opinion that antitoxin is of great value in the treatment of tetanus, it is difficult to draw definite conclusions as to dose or mode of administration from published statistics. Experimental evidence shows that tetanus toxin is at least partly conducted by the perineural lymphatics.

Basal Metabolism in Pregnancy and the Puerperium.—J. L. Baer (*American Journal of Obstetrics and Gynecology*, September, 1921) found in forty-four normal cases of late pregnancy that the basal metabolic rate in such cases averages thirty-three to thirty-five per cent. above the normal for nonpregnant women of a surface area equal to that of pregnant women. Three days after delivery the average rate is only fifteen per cent. above normal, and seven to ten days postpartum it is approximately normal. Death of the fetus in late pregnancy is detectable in a woman otherwise normal by a drop in the basal metabolic rate, compared with the average in the author's series. The increased rate in late pregnancy is due to the growing demands of the fetal organism and placenta. The incomplete or delayed return to normal is due to involution of the uterus and the onset of lactation. Twin pregnancy should show a rate above the average for single pregnancy when both twins are well developed. Thyroid enlargement may occur in pregnancy without increasing the basal metabolic rate above the averages obtained in the author's series. Differential diagnosis between uterine tumor and pregnancy will not be helped unless greater refinements in method show increased rates much earlier than in this series. The x ray can be called on as early as the fifth month and with reasonable certainty in the sixth.

Effect of Small Doses of X Rays on Hypertrophied Tonsils and Other Lymphoid Structures of the Nasopharynx.—James B. Murphy, William D. Witherbee, Stuart L. Craig, Raymond G. Hussey, and Ernest Sturm (*Journal of Experimental Medicine*, June, 1921) gave x ray treatment to forty-six patients with hypertrophied and otherwise pathologically altered tonsils and in some instances adenoid masses and lymphoid deposits posterior to the pillars and fauces. The factors of the dose were as follows: Eight inch spark gap measured between points, five milliamperes, ten inch distance from the target to the highest point of skin exposed; time of exposure, three to seven minutes depending on age of individual; filtered through three mm. of aluminum. The patients were observed for one month or longer after treatment, following which in all but four there was a reduction in the size of the tonsils and other lymphoid deposits in and behind the pillars of the fauces. As the tonsils shrunk, the crypts opened and drained, and the tonsils assumed a healthy appearance. Thirty-six of the forty patients showed hemolytic organisms, mostly streptococcus and staphylococcus, before treatment. After exposure to the x rays thirty of the thirty-six cases became negative.

Treatment of Blackwater Fever.—Nathaniel Crichlow (*Journal of Tropical Medicine and Hygiene*, September 1, 1921), writing from the Solomon Islands, mentions absolute rest in bed and good nursing as of prime importance in the treatment. The patient should be kept warmly wrapped up and covered with blankets. His bowels are to be well opened with three grains of calomel, followed in a few hours by a saline aperient. A bed pan is to be used where possible. The diet during the acute stage consists of milk only. Fluids in abundance are given by the mouth, e. g., soda water, albumin water, tea, barley water, whey, lime juice, and plain water. Rectal saline injections are given every four hours until the urine regains its normal color. If the attack is very acute, subcutaneous or intravenous saline injections are employed. Sternberg-Hearsey's mixture with the addition of tincture of digitalis is generally given and is found most useful. Vomiting is checked by hot applications and mustard plasters over the stomach, sips of cooled soda water, or a very weak solution of tincture of iodine. Headache is treated by cold compresses. Difficulty in passing water and anuria are treated by hot fomentations to the loins, hot packs, and fluids in great abundance by the mouth or by other routes as the occasion requires. Collapse is treated by hot applications to the cardiac region, alcoholic stimulants, and the hypodermic injection of strychnine and digitalis. Quinine is withheld during the acute stage, but as soon as the urine regains its normal color, five grains of quinine bihydrochloride three times daily are begun. During convalescence a tonic containing quinine, iron, arsenic, and strychnine is given, and upon recovery the patient advised to go to a temperate climate. In one of the author's seven cases the measures outlined above failed, but methylene blue, four grains three times daily, had a marked effect; he is not certain, however, that this was a true case of blackwater fever.

Proceedings of Societies

BRITISH MEDICAL ASSOCIATION.

Eighty-ninth Annual Meeting Held in Newcastle-upon-Tyne, July 19, 21 and 22, 1921.

Under the Presidency of Dr. DAVID DRUMMOND.

(Concluded from page 675.)

Rate Provided Hospitals.—Sir GEORGE NEWMAN, chief medical adviser of the Ministry of Health, opened the discussion on the relation of the medical profession to local authorities in respect to rate provided hospitals. He suggested that in rate provided institutions the authority should give consideration to the practicability of the following means: That representatives of medicine should be associated directly, by cooption or otherwise, with the public health committee or other governing body. That there should be a medical staff committee for the medical administration of the institution. That the services of general practitioners of the area should be obtained for the institution, on the staff or otherwise; such an arrangement would secure their interest and support, provide facilities for postgraduate study, benefit the patients directly, and increase cooperation between the consulting staff of the institution and the practitioners of the neighborhood. That the medical staff should be paid for their professional services, either by the authorities or by the patient, on a fixed basis mutually agreed between the authorities and the staff; that the tenure of office should be fixed; and that such part time staff should recognize the suzerainty of any whole time medical officer. That there should be a local medical advisory committee appointed by the medical profession in the district which should be consulted by the authority on important medical propositions affecting the institution.

Sir George Newman thought that some such arrangement would meet the case and safeguard the reasonable claims of the profession, without prejudice to the essential principle that the ratepayer who pays the piper may call the tune.

Councillor DAVID ADAMS, of Newcastle, said that a unified medical service was imperative. It would appear that a state medical and allied service must ultimately be evolved; and in spite of today's hostility this evolution would be slow but peaceful and with the consent and cooperation of the medical profession itself. The entire poor law system, wasteful, costly and depressive, ought to be abolished. With regard to the relationship of the medical profession to rate aided institutions, Mr. Adams said that long civic experience had convinced him that a statutory committee of the existing local authority would prove the most efficient instrument as health authority.

Poor Law Infirmaries.—A report was drawn up which contained several recommendations as to the utilization of these infirmaries for civil needs. Dr. H. C. BRISTOWE moved an amendment which provided for the principles of the report being applied to poor law hospitals in urban areas, and, that

any utilization of such hospitals in rural areas must, if occasion required, be considered *ab initio*. Mr. McADAM ECCLES, of London, moved that a metropolitan provident scheme for hospital and additional medical services be approved as conforming to the policy of the association. The principle underlying the scheme was the creation of a provident fund, contributors to which would be entitled to the use of hospital facilities upon the recommendation of their general practitioner.

The Therapeutic Value of Alcohol.—ALFRED PEARCE GOULD, late vice-chancellor of the University of London, and a vice-president of the National Temperance League, delivered an address on this subject. He said that it was a matter of common knowledge that the use of alcohol as a therapeutic agent had rapidly and greatly lessened during the past thirty years, and it was the agreed opinion of pharmacologists that, in the very limited and lessening field of medical practice in which alcohol was still employed, it was of value only as a narcotic and not as a stimulant. He did not believe anyone would care to dispute the statement that the four hundred or five hundred millions of money spent each year by the British people in the purchase of alcoholic drinks was a grave cause of inefficiency, as well as a prodigal waste. He submitted that the medical profession had a very special responsibility in reference to the widespread custom of the use of alcoholic drinks as beverages, and that the profession generally had not yet adequately realized and shouldered that responsibility.

Evolutionary Wounds, Their Healing and Rôle in the Evolution of the Human Body.—Sir ARTHUR KEITH, conservator of the Museum of the Royal College of Surgeons of England, in an address on this subject pointed out that the power to heal was part of the essential machinery of life, but there was a tendency among medical men to take too narrow a view of this marvelous property of repair possessed by all living tissues. Healing was supposed to be a gift that came into operation only after birth in order to preserve us in the rough and tumble of this world. The speaker showed, however, that healing was a process which came into play long before birth, and that nature, in fashioning the body and brain of man, which may be described as her wildest evolutionary venture, had made the freest use of just that same process she employed in mending the simplest cut of the skin. He went on to describe the nature of embryological wounds and the process of healing. As an example, he referred to the upper lip of a human embryo towards the end of the sixth week of development. At this time, he said, a cleft descended from each nostril to enter the roof of the mouth, thus dividing the middle part of the upper lip from the two side parts. These clefts or wounds in the lip had not been produced by a knife, but by an evolutionary process. Originally the nose consisted of two separate pits, but at an early stage, in the evolution of the verte-

brate animals it became advantageous that water passing into the gill chamber should first be sampled by the nose; hence each pit became connected with the mouth by a deep groove or channel. That is how it came about that two evolutionary wounds had to be healed in the formation of the human upper lip. For reasons not yet understood an evolutionary wound might fail to heal, just as sometimes happened in one produced by the surgeon's knife. In the case of the upper lip the congenital condition known as cleft or hare lip was thus produced. Here nature's operative skill had failed her and the human surgeon had to step in and take her place. Healing was not the gift merely to enable man and beast to overcome the accidents of life, but was something much deeper than that. As knowledge of vital processes grew, the more certain would it become that the problems which faced the biologist and the surgeon were the same.

Sir Arthur Keith said that the object of his lecture had been to make his auditors realize the miracle of it all. In conclusion he said that he had had one other aim in giving the lecture. Everyone had become so familiar with the ease with which clean wounds healed that we had failed to realize the miracle that was taking place daily under our eyes. This was true not only of the layman but of the surgeon and pathologist as well. It was more than true of men like himself who had studied the mechanics of development; they became so accustomed to embryonic evolutions that the underlying mysterious machinery ceased to arrest their attention or rouse their curiosity. In every instance hitherto explored the mysterious and miraculous had proved to be the children of ignorance. When knowledge of healing had reached the point of being a science, the closure of a wound would no longer be considered a miracle.

Blood Diseases in Children.—In the section of orthopedics and diseases of children Dr. J. Hugh Thursfield, assistant physician to St. Bartholomew's Hospital, read a paper on blood diseases in children. Before discussing the anemias of childhood he attempted to define exactly the scope of the subject. He pointed out that it was not easy to define what was meant by anemia, though it was easy to recognize its existence. He supposed he might take it for granted that all were in agreement that during life the corpuscular elements of the blood, both red and white, were derived from the bone and marrow, although it was possible that some of the lymphocytes were produced from lymphoid tissue elsewhere: and that the hemoglobin, whatever might be the exact site of its formation, entered into the corpuscle within the bone marrow. Anemia was, therefore, in the broadest sense, an affection of the hemopoietic tissue of the bone marrow, or in some cases possibly merely a defect of hemoglobin formation. Also he thought that it was unanimously agreed that this function of the bone marrow might be disturbed by toxins acting either by diminishing its reproductive powers, or by destroying the product more quickly than it could be formed. It was probable that in most cases of anemia there was a poisoning of the hemopoietic system and an exaggerated destruction of the finished product.

Whatever might be the nature of the poisons the ultimate source of many of them was almost certainly infective and the power to arrange and classify the various types of these diseases seemed to him to be dependent upon the recognition of this fact.

Dr. Thursfield suggested that the methods which were being employed for the elucidation of the problems of anemia should be discussed. For the most part, clinical observation and the study of the morphology of the blood corpuscle, especially as seen in dried and stained films, had been relied on. He was of the opinion that the knowledge to be derived from this method of study was not stabilized, and that much of the later work in this field was sterile. He held that there were many problems in connection with the function and life history of both the red and white corpuscles of the blood, but of the white in particular, the solution would probably be of great value. He proposed to classify the anemias as: 1, congenital; 2, secondary, that is, those in which removable cause was operating to produce the anemia; and 3, primary, those in which an unknown and at present, usually unascertainable cause was operating. Congenital anemia, secondary anemia, and primary anemia were considered in turn and the point was emphasized that in his judgment the anemia gravis type was caused by an infection, and he thought that our main efforts should be directed to the early detection of the focus of infection.

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AMERICAN CLIMATOLOGICAL AND CLINICAL ASSOCIATION.

Thirty-seventh Annual Meeting, Held in Philadelphia, June 15, 16, and 17, 1921.

The President, Dr. LAWRASON BROWN, of Saranac Lake, N. Y., in the Chair.

(Concluded from page 675.)

The Diagnosis and Treatment of Algid Malaria.—Dr. THOMAS D. COLEMAN, of Augusta, Ga., defined pernicious malaria as a grave form of chronic malaria caused by the plasmodium, which always occurred in patients who had previously had malarial attacks or had resided where malaria prevailed. It would carry off the patient with great suddenness. In the classifications of pernicious malaria which he had seen, he thought that the tendency was to make too minute subdivisions, based on differences in degree rather than in kind. He still adhered to his own classification, namely, comatose, algid, and hemoglobinuric (commonly called hemorrhagic). These types were produced by a clumping of the organisms in different parts of the body. In the capillaries of the cerebrum, it produced the comatose; in those of the medulla and basal ganglia, the algid; and in the red blood cells of the general circulation, the hemoglobinuric. The diagnosis of algid malaria, he said, rested on the clinical and laboratory tests, the former embracing periodicity and the effects of quinine; and the latter, the presence of the parasite or its products. The symptoms usually complained of included definite or indefinite attacks of fever or chills and fever, ill defined pains in the back and limbs, sometimes

headache, lack of inclination to exertion, loss of appetite, and indigestion with attacks of diarrhea or constipation. Examination showed a diminution in the red blood corpuscles and hemoglobin, a decrease in the mononuclear leucocytes, flabbiness of the heart muscle, highly colored urine containing an excess of urates and urobilin, enlargement of the spleen and liver, coating of the dorsum of the tongue and redness of its edges, yellowing of the conjunctiva, and harshness and greenish yellow discoloration of the skin. In some cases the patients would not show jaundice, but merely appeared anemic. The treatment should not be postponed until an explosion occurred, but should be instituted in time to prevent the explosion. In cases presenting symptoms of chronic malaria, repeated search of the blood should be made for the plasmodium. Failure to find the parasite, however, would not negative the presence of malaria. The author had obtained very little satisfaction from the use of any other drug than quinine, and did not think that time should be wasted in experimenting with anything else in such grave cases. The dose for adults should be five to ten grains every six hours for a week, then ten grains daily for three weeks or more. When given by mouth, in order to secure absorption, either a capsule or a solution should be used, as the tablet or sugar coated pill would be likely to pass through the alimentary tract undissolved. In cases of nausea and vomiting, the drug should be given either intramuscularly or intravenously, in urgent cases, five to ten grains being injected every six hours for a week. After this, ten to fifteen grains should be given daily for two or three weeks or more by mouth. In cases of such gravity, idiosyncrasies to quinine should not be considered, the author preferring to take his chances of combating any harmful tendencies of the quinine by the use of other remedies, including stimulants.

Dr. J. M. ANDERS, of Philadelphia, in discussing the subject, said that the paper read by Dr. Coleman was one of great interest, more particularly to those who had had the privilege of seeing similar cases. In the United States, the pernicious forms of malaria were most common in the southern and southwestern states; but they also occurred in the Middle Atlantic states, and had been known to occur in Philadelphia. While serving as resident physician in the Episcopal Hospital, and subsequently as a member of the staff, he had seen many cases of malaria, including pernicious ones, but during the last two decades he had not seen any. Unfortunately, he said, writers upon the subject of malaria were not in perfect agreement concerning the terminology of the algid form. Some called it pernicious malaria and others subdivided it into various groups or types, according to their clinically dominant features. He believed that a full algid form should be distinguished from others, and he had applied the term true algid form to cases presenting the comatose condition and hemorrhage. Others had recognized other types; but this true algid form was vastly different, and ended often in death within a few hours if not properly treated. Dr. Coleman had given a clear and accurate picture of chronic malaria, as it used to be called, and Dr.

Anders said he agreed with him that these pernicious forms were chronic types. He felt, however, that all types should not be called pernicious, but only those in which there was a subsequent explosion, as had been explained by Dr. Coleman. In other words, these types were not primary attacks, but occurred in persons who had had previous malarial attacks of various sorts, or who had manifested symptoms of chronic infection. No case of pernicious malaria could be diagnosed without finding the plasmodium in the blood. Cases of pernicious malaria not due to the tertian parasite, or simple intermittent fever, were often reported, and this, he said, led him to emphasize the fact that, in the treatment of this condition, no case of pernicious malaria should be allowed to recur, but that not only should cases be treated until the paroxysms had ceased to occur, but also until the blood was thoroughly sterile.

Dr. H. R. M. LANDIS, of Philadelphia, said that a few cases of malaria were seen here, now and then, but not so many algid forms. He did not remember having personally seen a case of this kind in Philadelphia. The number of cases of algid malaria that he had seen were few. He had never seen the pernicious form, but had examined a number of specimens of blood sent from Panama. He had also seen cases of pernicious malaria elsewhere, and recalled examining blood and finding one specimen, each cell containing its own individual parasite. It could readily be understood why there should be hemorrhage, urea or anemia; or divers symptoms and signs of hemoglobinuria, and, furthermore, similar paroxysms. At the termination of the cycle, before making issue into the blood current, the parasites deposited a certain amount of poisonous material in the red cells.

Concerning the medication which Dr. Coleman had used, Dr. Landis agreed with him in thinking that quinine should not be given in the form of sugar coated pills or tablets, because these might go right through the alimentary canal undissolved and not be absorbed. In varying states, one might get varying degrees of absorption. The effect desired was upon the circulation. When given by mouth, the quinine might not produce this effect. In serious cases, the patient would get very little benefit from the remedy. Therefore, where there was an opportunity for the quinine to be used, it should be the hydrochloride, and should be given by mouth or intravenously. So far as other drugs were concerned, he was afraid of the psychological effect of methylene blue, which produces blue urine; but where quinine could not be considered this drug was used.

Acute Epidemic Encephalitis.—This paper, by Dr. CHARLES H. MINER and Dr. STANLEY FREEMAN, of Wilkes-Barre, Pa., was read by Dr. MINER. It gave studies of a series of cases with marked vascular hypertension, with especial reference to their etiology. From these studies the authors had been led to believe that in any case presenting fever and cranial nerve paralysis (particularly of the third and seventh nerves), accompanied by stupor or lethargy and with muscular fibrillation or tremor, together with a masklike face, a diagnosis of encephalitis should be seriously considered. They had

found the spinal fluid practically normal in all the cases, but believed that spinal puncture should be done when possible, in order to exclude cerebrospinal and tuberculous meningitis, anterior poliomyelitis and cerebrospinal syphilis. While there were many other conditions that might be confused with acute epidemic encephalitis, they felt that the cases of that disease, as they had seen them, were so characteristic and had so uniformly the same symptom complex that the diagnosis could readily be made by one who had once seen the disease.

Concerning the Diagnostic Value of Cardiac Murmurs.—Dr. GLENTWOOD REEVE BUTLER, of Brooklyn, thought that there must be a very large number of persons who were unhappy because of a mistaken diagnosis of valvular heart disease, usually mitral insufficiency, the mistake having been made because of the axiom that a systolic murmur at the apex spelled organic incompetence of the bicuspid valve. He said that there were three chronological types of murmur, namely, diastolic, presystolic, and systolic. He thought that in the majority of cases the presence of an aortic diastolic murmur afforded reliable evidence of aortic insufficiency, but that, even with this murmur present, it was not safe to make the diagnosis without the confirmatory evidence of a water hammer pulse, throbbing carotids, capillary pulsation, and a pistol shot sound in the femorals. Presystolic murmurs he regarded as being usually untrustworthy. To make a diagnosis of mitral stenosis without a definite murmur was unjustifiable, he thought; but even here, he admitted, there were possibilities of error. If the usually reliable diastolic and presystolic murmurs lent themselves occasionally to misinterpretation, so, to a vastly greater extent, would the multitude of systolic murmurs. Aortic systolic murmurs, Dr. Butler said, were diagnosed by many men as aortic stenosis, forgetting that such murmurs were very common as the result of a slight roughening of the valves or the root of the aorta. They might also be accidental or functional. In reality, aortic stenosis was a rather rare lesion. He considered pulmonary systolic murmurs substantially negligible in the ordinary run of cases. Only when a sign of congenital malformation was present was it indicative of organic disease. Apical systolic murmurs were believed by Dr. Butler to constitute the greatest stumbling block in the way of correct diagnosis. Most often they were of cardiorespiratory production. Uncomplicated (primary) mitral insufficiency should be classed among the comparatively infrequent valve lesions. It should not be diagnosed unless, in addition to the murmur, there was evidence of cardiac hypertrophy.

The Ultimate Prognosis in Vascular Hypertension.—Dr. G. MORRIS PIERSOL, of Philadelphia, in presenting this paper, said that the prognosis in cases of hypertension often depended in large part on their etiology, the mortality being much greater in nephritics than in any other group, as among his cases five times as many of these patients had died as among those suffering from other conditions. None of his cases in the climacteric group had had a fatal termination. The period of time from first coming under observation until death was much less

among the nephritics than among those with hypertension from other causes. The patient, with the highest blood pressure among his cases was known to have had this high blood pressure for eleven years. In all, he studied 134 cases of persistent hypertension, and from this study he concluded that persistent high blood pressure was more common as the result of chronic renal disease than it was from other causes. He also found hypertension of renal origin somewhat more common in men than in women. Primary hypertension of the climacteric variety, if regarded as a type of hyperpiesis, would make primary hypertension appear to be twice as common in women as in men. The most common causes of death in cases of persistent hypertension were cerebral hemorrhage and cardiac failure. The height of the blood pressure alone would not furnish an adequate basis for prognosis.

The Ductless Glands.—Dr. WILLIAM DUFFIELD ROBINSON, of Philadelphia, read a paper on this subject, in which he stated that, when there was a lack of proper balance caused by the failure of the endocrine glands to function properly, most of the other organs of the body would be adversely affected. The endocrine glands, he said, owed their power of stimulating activity in cells in near or distant parts of the body to the fact that they contained or secreted substances known as hormones, or excitants, which were of simple chemical composition, and could pass quickly through the walls of the bloodvessels. He classified these glands into, first, nutritive glands and regulating and stimulating glands, the first being represented by the thyroid, thymus and hypophysis, and the second by the adrenals. Hormones were classified as acute and chronic, the former being those of the adrenals and the posterior lobe of the pituitary; and the latter, those of the anterior lobe of the pituitary and the thyroid. The action excited by acutely acting hormones was of only short duration. The condition of the glands could be told by the amount of hormones they secreted. The hormones of one gland might act in association with or in antagonism to the hormones of other ductless glands. The author considered in detail the different endocrine glands and the conditions produced by hypersecretion and hyposecretion of each, and spoke of the interrelation existing between the hypophysis, or pituitary gland, and the thyroid, thymus, suprarenals, and the sexual or gonadal glands. Dr. Robinson stated that, when a hormone floated in the blood stream, the cells of that organ requiring this hormone would appropriate the amount it needed. When, however, more was required than was offered by the blood from the endocrine making this hormone, the endocrine making an analogous hormone would supply its hormone to the hungry cell. If these hormones were supplied artificially by giving the patient dried glands or active preparations made from them, the undersupplied cells would take the required number for normal use. He further stated that the emotions act on the endocrines, and that the endocrines produce emotions. Dr. Robinson thought that what had been proved and what had been indicated as probable showed what wonderful possibilities the future might reveal.

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NEW YORK, WEDNESDAY, DECEMBER 21, 1921.

Letters to the Editors.

A PLEA FOR THE SALE OF CHRISTMAS
SEALS.

NEW YORK, December 10, 1921.

To the Editors:

Because of the favorable reports of results obtained by the tuberculosis campaign in the reduction of the death rate from tuberculosis, many well-meaning people think that there is no longer any need to help in that direction. Yet if there was ever need of funds to carry on the antituberculosis work efficiently, it is now.

Tuberculosis, as a rule, does not begin in adult life. It is most frequently contracted in childhood. While it may always remain a latent infection and never develop into a disease, where there is privation and want, underfeeding, insufficient clothing, and overcrowding, tuberculosis is bound to develop in the infected child. Malnutrition among children whose parents are in poor or moderate circumstances is more to be feared this year than ever before.

Let us come to the rescue of those thousands of children and the thousands of men and women who are in danger of becoming tuberculous. But besides doing this glorious preventive work, we must also be reminded that there are yet many, many tuberculous cases without proper medical care, some who should be in a sanatorium, others in a hospital, others in more sanitary environments, and others who should receive medical supervision.

I appeal to the hearts of men and women who have enough food, enough clothing, and a comfortable home, to think of the little children and the men and women who may be saved from contracting tuberculosis, and those who may be cured by proper and timely treatment and care.

I have had the privilege of being associated with many great, generous, and noblehearted men and women who, after they had learned of the needs of

the consumptive poor, found their greatest happiness in financially and actively joining this great humanitarian movement. It is true much has been done, but there is more to do. Not only must the work be kept up, in order to retain the good results already obtained, but it must still be expanded in order to get better and better results in the future.

The immortal Pasteur once said, "It is in the power of man to cause all parasitic (germ) diseases to disappear from the world." Let us begin with tuberculosis and show our power.

S. ADOLPHUS KNOPF, M. D.

THE NEW CLINIC.

NEW YORK, October 29, 1921.

To the Editors:

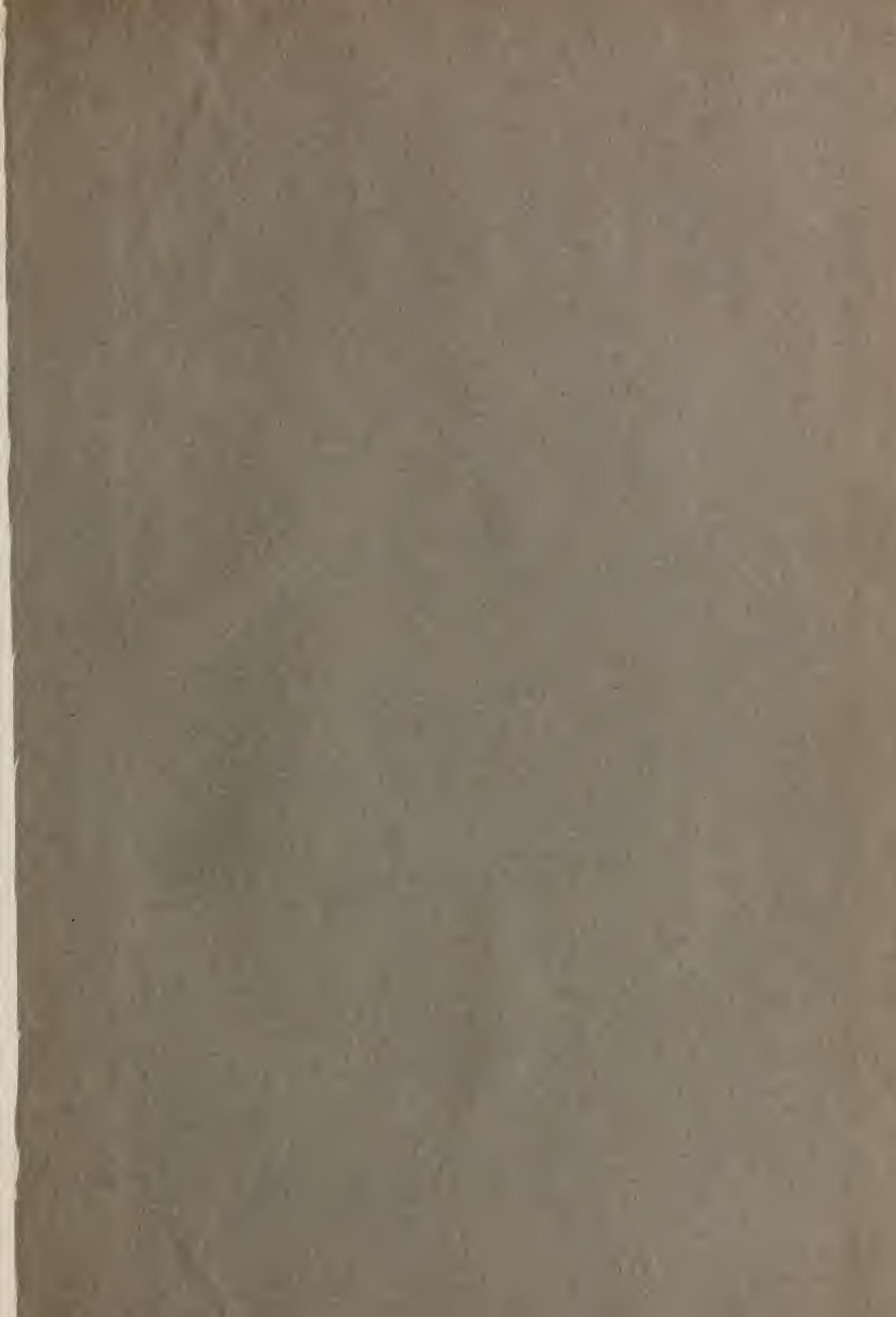
The Council and Faculty of The Cornell University Medical College announce a reorganization of the Dispensary Clinic in the College building, First Avenue and Twenty-seventh Street, by which from November 1, 1921, the clinic will be conducted under a new plan, designed to develop much greater efficiency in diagnosis and treatment in all of the chief branches of medicine and surgery. In order to meet the greatly increased expense of a well paid staff, there will be an advance over the nominal fees heretofore charged. It is the desire of the college to render a needed service to a major group in the community and to offer cooperation in diagnosis to the medical profession.

The public will benefit, by obtaining at a fee within the reach of the wage earner, the thorough medical service assured in a teaching institution, supplemented by the efficient laboratory, x ray and therapeutic facilities of the college. The clinics will be held each afternoon from 1:30 to 4, and Tuesday and Friday evenings from 5 to 7:30. Specialists in all departments of medicine and surgery will be present at these times for examination and treatment. An efficient administrative organization, the limitation of the number of patients admitted and the utmost privacy and consideration will insure the patients unhurried and courteous service.

The medical profession is offered the cooperation of a group of specialists, to which it may refer needy cases for general diagnosis or single examination. Cases so referred will be returned to the physician after careful study, with a written report of findings and recommendation for treatment. No case referred to the clinic will be given treatment except at the direct request of the referring physician.

The diagnostic clinic will be directed by the Department of Internal Medicine which will analyze the reports of the specialists in connection with the laboratory findings and after consultation, determine upon the diagnosis and proper treatment. The members of the college faculty will exercise direct supervision and control over the work in the clinics and will take an active part in the diagnostic procedure. Members of the profession who wish to accompany their patients will be welcomed at the clinic. It is hoped that physicians will avail themselves of the facilities offered under this plan and that they will give it their hearty cooperation and support.

WALTER L. NILES, M. D., *Dean of the College.*



Medical Record
of New York

Annex

