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PHYSICAL TRAINING AS A THERAPEUTIC AGENT.*

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PERMIT me to express my appreciation of the compliment implied in being asked to present a paper to this association of experts, teachers, and leaders in every department of physical education. It falls to my lot, naturally, to consider this subject in the light of its fitness to aid us in developing the defective or imperfect organization, in our effort to regain, in whole or in part, muscular power and efficiency lost through disease, in correcting abnormal functions of the body, in breaking up habits which tend to lessen the efficiency of action, in correcting deformity in any part, the existence of which is detrimental to beauty and symmetry, or which interferes with mechanical efficiency, and in assisting to improve and regulate will power so that it may be economically and wisely directed and applied. I shall deal more especially with those phases of the work seen in my own practice.

The law which declares action within physiological limits as a chief factor to aid development is well established and receives confirmation on every hand. The babe throws his arms about and springs up while standing upon his mother's lap and tosses his body to and fro in a seemingly purposeless manner; but, the while, is obeying Mother Nature's behests, and is practising, not only that size and power of muscle may increase, but that he may learn the art of intelligently balancing himself and of directing

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**FIGURE I.**

Mode of progression adopted by a boy having paralysis from anterior poliomyelitis.

his muscles to the accomplishment of purposeful actions. The youth who purposes to enter contests demanding great and prolonged effort is examined to ascertain whether he is "fit." If it be found that after moderate exertion his pulse goes above one hundred, or if in other ways he betrays a lack of well-rounded physical competency, he is sent back to practise where he may

do so in moderation, but with ever increasing force and effort in order that all the elements which go to make up an effective physical unit may be brought to their highest efficiency. To accomplish the desired result it is necessary, not only to obey the part of the law which demands action, but also that part which says *action within physiological limits*. It may be difficult to determine at all times the exact physiological limits, but there certainly is such a limit, and to pass that line is to produce "strain," and to interfere with and delay the end sought, and to lower permanently the element of possible achievement for that individual.

Efficiency may be lost or lowered through disease. What can be done towards restoring wholly or in part to normal power? Perhaps no better illustration presents itself here than that afforded by the disability which so frequently results from infantile spinal paralysis. This affection is a paralysis of motor power, disables the lower extremities most frequently, results from inflammation of the large motor cells in the anterior columns of the spinal cord, manifests itself irregularly in the various groups of muscles, seldom causes complete motor disability of any extremity, and shows a natural tendency towards recovery, continuing for some years, but never becoming complete.

The motor cells of the cord are seldom entirely destroyed. Some cells, doubtless, which preside over the action and nutrition of their nerve fibres lose all power; some are injured to such an extent that the nerve fibres passing from them to muscle convey their messages but imperfectly; and others are probably capable of restoration to a condition nearly normal, while still others escape uninjured.

Occasionally all the muscles of the lower extremity are so entirely without motor control that not a movement can be made. In many other cases the loss of power is partial. For example, at the knee the power of extension is lessened or lost, while flexion may suffer little or no impairment. In this case there is a lack of balance, and the flexors acting continuously, while not opposed, or only partially opposed by extension power, produce habitual or permanent flexion at the knee—a definite deformity with constant impairment of function.

Similarly, an unequal degree of paralysis of the various muscles which control the ankle produces a lack of balance. The muscles which draw the foot inward may be stronger than those which oppose, and the foot be constantly drawn inward, permanent deformity results, and there follows a case of paralytic club-foot and great interference with function, an interference which is now not only due to loss of muscular power but also to

mechanical inefficiency, owing to the fact that the foot is no longer directly under the weight to be supported. There are thus two distinct and well-marked elements which together constitute the disability in such cases.

The mechanical element in the disability may be remedied by operative means or by the employment of braces; the muscle and nerve element, the lack of control and of power, can best be remedied by physiological means. By persistently directing the attention and effort of the individual to the performance of



FIGURE II.

certain desired actions new combinations may be formed, combinations which were not necessary when there was normal control before the intervention of disease.

In illustrating this point allow me to present the case of a young woman (Fig. 2), seventeen years of age, weighing one hundred and thirty-five pounds, who, as she lay in bed, was not able to make any movement of either lower extremity because of an attack of infantile spinal paralysis two years previously. Physical training commenced with this patient September 1st

last, and at the end of three months she was able to walk unaided except by her braces and crutches. In order to afford her an opportunity to place one foot before the other, as in walking, her weight was suspended by straps under the chin and occiput, attached by a rope to a car running on a trolley line about five feet above her head. In this way her entire weight could be sustained, allowing only sufficient downward pressure to enable her to feel her feet upon the floor. A rope passing on either side of her, parallel with the trolley line, at such a height that she could conveniently place her hands upon the rope, she drew herself repeatedly across the gymnasium and learned gradually to place each foot before its fellow, alternately, as in walking. After a few weeks' practice in this manner she was given crutches, and at the same time braces were applied extending from her boots to the perineum, so adjusted that the knees were prevented from bending while she was in the upright position. The amount of suspension power was now gradually lessened, permitting more and more of her weight to come upon the feet and crutches. Gradually she acquired more and more ability to move forward by these aids, until within the three months she had learned to balance and to make progress without the aid of the trolley suspension. Throughout this period of training other means, also, such as massage, were employed. When I stated above that she was unable to move either limb while lying upon her bed, I meant explicitly what the words express, and that condition still persists. Notwithstanding this fact, when in the erect position, and her weight suspended almost entirely from the trolley line referred to, she learned in some way to make muscular effort sufficient to carry the limbs alternately, one before the other, as in walking. I cannot tell the exact muscle combinations by which this was accomplished, but practical efficiency has gradually improved until she has learned to walk with a fair degree of ease, aided only by the braces and crutches referred to. This may seem to be a small accomplishment, but when one considers that in regard to motility this was a case of complete paraplegia, and that this woman will be henceforth independent of the aid of any person in her efforts to move about, the benefit is certainly very great, and could not have been obtained without the aid of the physical education which has been given since September last.

Another illustration. A patient who from any cause permits the arch of the foot to drop down below the normal limit and allows the foot to roll into a position of pronation, may have the attention so directed to the use of the muscles which hold the arch in a normal position and have the habit of holding it in this corrected position so confirmed by practice as to overcome the deformity, hold the foot in its normal attitude and obviate the

pain and disability consequent upon flat-foot. In many cases, especially in childhood and youth, such treatment is more satisfactory than treatment by operation, by the use of flat-foot plates or by other mechanical means. It is well, however, to employ mechanical aids in addition to the physical training. Properly constructed boots are among the best means to be employed.

While thus speaking of the means used to improve the efficiency of the foot emphasis must be laid upon the habitual maintenance of a correct position. "The support and propulsion of body weight are the master functions of the foot. The straight



FIGURE XI.
Torticollis.



FIGURE XII.
After operation and physical training.

or nearly straight foot is naturally used by children, primitive people, mountaineers, guides, hunters and strong and enduring walkers and runners. The straight is the position of strength and efficiency. The out-toeing gait is typical of the weak and broken-down foot and is stiff, awkward and fatiguing. Spinal curvatures are usually found associated with weak feet, while the position of the feet advocated is commonly found associated with level pelvis and shoulders, straight spine and high chest. In this position the pose is easy and graceful and the colour pleasing and correct." (Henry Ling Taylor.)

Physical inefficiency is often the result of habit. A patient who became lame through the existence of disease, or from an injury, forms the habit of limping or of standing in a faulty attitude. While in the treatment of such a case it is well at the commencement to set right an unbalanced joint, straighten a crooked limb or correct other deformity, yet the physical training which should follow occupies just as important a place in the treatment as did the surgical operation or the mechanical support. Figs. 11 and 12 illustrate a case where operation, in a case of torticollis, was necessary at the outset. Afterward physical training was the essential treatment. Within the limits of



FIGURE III.



FIGURE IV.

Same patient as figure three.

the writer's experience such training as is here referred to is best obtained by working in classes. Class work has many advantages over individual work, as it secures the greatly desired association with, and example of, other persons, and affords the director due opportunity to bring into full play the pedagogic practices based on emulation. By such means it will be found that the limping that was so very objectionable, or the attitude of the body which has become habitual, may be made to so disappear as not to be noticeable to the ordinary observer. (Figs. 3 and 4.)

Perhaps it is in the correction of certain deformities that gymnastic training has been most generally employed as a therapeutic agent. Not many years ago curvature of the spine and round shoulders were treated very generally by means of shoulder braces and various mechanical supports. To-day it is recognized that such methods are more harmful than helpful.

Deformities of the spine and thorax are due to many different causes—congenital defects and irregularities in the skeleton, injuries or diseases, causing a lack of symmetry in the lower extremities, faulty attitudes assumed at school or at work being the most common. Radiography has come to our aid in showing that there is found, not infrequently, a congenital lack of symmetry in the two sides of the vertebral column. For example, in the transition from the cervical to the dorsal type, or from the dorsal to the lumbar, or from the lumbar to the sacral, the seventh or eighth vertebra may present cervical characteristics on the right and dorsal on the left, while the nineteenth or twentieth vertebra may have dorsal features on the right side and lumbar on the left, and a similar lack of symmetry may appear in the lumbo-sacral region. It will at once become manifest that this would cause the thoracic cavity to begin and continue lower on one side than upon the other, or would cause the base of the sacrum to present, not a horizontal plane, but one slanting in an oblique direction. Other congenital abnormalities also are found which are brought plainly into view as causative factors. Neither the abnormalities referred to nor the trunk deformities are likely to be noticed in infancy because the full effect of the lack of symmetry does not manifest itself until the upright position has been maintained for a considerable time. When the foundation upon which the trunk rests, or any part of it is oblique, the part immediately above must follow in a line which will depart from the vertical. This departure from the vertical will tend to increase as time passes and the departure to the right or left will disturb the body balance and will cause the part of the trunk still further up to lean in the opposite direction in order to maintain equilibrium. In this is found the explanation of the compensatory curve.

It will at once be seen that nothing can be done to remove the cause here referred to. There are also other causes operating to produce trunk deformity which cannot be removed; such, for example, as lack of symmetry in the lower extremities, or in the development of the two sides of the pelvis. These causes cannot be removed by any means, but in some measure their effects may be counteracted. Mechanical means, when applied to the lower extremities for the purpose just referred to, as, for example, adding cork under one boot to make up for a short leg, may be

employed advantageously, but when employed on the trunk so as to forcibly correct thoracic irregularities by continuous pressure, they hinder the natural use of the muscles, prevent normal development, and create a habit of resting upon a brace as a crutch to maintain the erect position, and the effect is likely to be more harmful than helpful.

In the physical training given to overcome or lessen these deformities the emphasis should not be laid upon muscular development, but upon education. There are two elements in this



FIGURE V.

Lateral curvature from infantile spinal paralysis.



FIGURE VI.

Same patient as figure I.

work: The first has for its object the forcible temporary straightening of the spine and the making it supple. The second has for its purpose the educating of the individual. Means should be employed to have the patient assume the best attitude possible under the eye of the instructor; full explanations should be given; a large mirror should be employed, showing the body in its deformed attitude and when held in its ideal position. The patient should be encouraged to exercise before the mirror, so as to be able to observe the attitude maintained, should move away for a short time and return again to see how fully the best possible position has been held.

The question is not what particular form of exercise should be employed, but how nearly an ideal position can be maintained while performing all movements. It is this educative factor which is of the utmost importance. Like all educative efforts, its success will depend upon the ready co-operation of the patient. Hence the personality of the instructor is a most important factor. The best results, therapeutically, will be obtained by the teacher whose tact can secure the most loyal attention and persevering efforts in working toward the one end which is in view. (Figs. 5 and 6.)

There are other means which may be employed, means of great importance and efficiency, which may be best used in connection with the work in the gymnasium.

If the spine is to be rendered more supple and to be forcibly impelled toward a straight line it would seem one of the simplest and most effective methods to suspend the patient by the chin and occiput and allow the body weight to pull the vertebral column into a more or less vertical line. So far from this being disagreeable to the patient I find it a favorite amusement in the orthopedic gymnasium, where I have a rod running lengthwise along the centre of the ceiling, fifteen feet from the floor. From this are suspended six or eight ropes from which the patients swing to and fro through an arc of more than twenty feet, the entire body weight being suspended by the straps under the chin and occiput above referred to. The forcible extension may be carried still further by applying heavy weights to the feet. We have in this way employed weights up to the amount of fifty pounds while the patient is simply suspended, but not swinging. (Figs. 7 and 8.)

A further force is employed to urge the spine toward a straight line by employing a girth while thus suspended. This girth is passed around the body and pulled upward, and in such a direction as to make pressure at right angles to the curve and at the point of greatest convexity, thus using most powerful means to force the rigid and resisting spine and ribs into a better form and stretching the ligaments and other soft structures on the concave aspect of the spine. In the use of the girth the force should be employed, not in the direction of a transverse axis passing through the body, but nearly in an antero-posterior direction. The force is thus employed not only to lessen the lateral deviation, but also in such a manner as to lessen the amount of rotation, which element it is always difficult to correct. This method of forcible correction, among other advantages, has this, that it is entirely under the patient's control. Hence she is willing to relax more completely and thus allow the corrective force freer play. The only danger is in having made a mistake in



FIGURE VII.

diagnosis, and having admitted to the orthopedic gymnasium a patient who has disease and not simply deformity in some part of the trunk. I have employed this method for more than fifteen years without having had any occasion for regrets. (Fig. 9.)

Still another method of employing forcible means of correction is found in the use of the rotation rack, as seen in the illustration

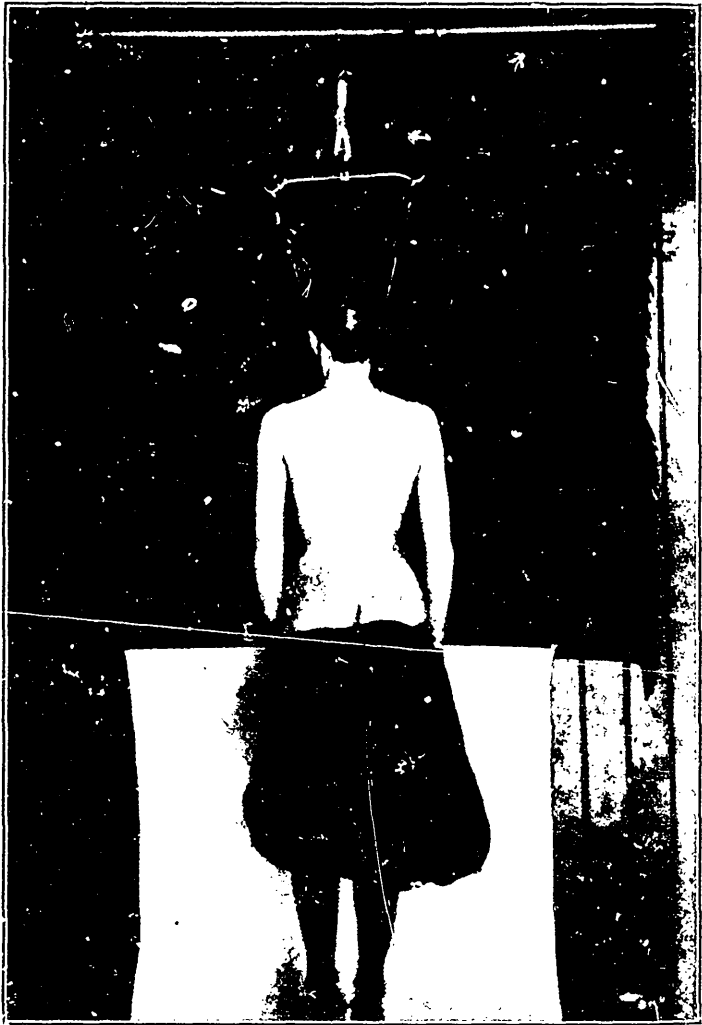


FIGURE VIII.

Same patient as in fig. 7, showing the effect of suspension of entire body weight.

tion. In this way a force may be employed up to the extent of at least eighty pounds. (Fig. 10.)

Corrective force employed as described above is much more effective than when employed through the agency of a brace or of any form of Zander machine. The brace exerts a continuous pressure force and therefore tends to produce atrophy, hinders development and growth and encourages the patient to lean upon the brace as upon a crutch. A force applied directly by another



FIGURE IX.

Same as figures 7 and 8, showing here suspension of body weight, thirty pounds additional and lateral force of the girth.

person is not so well endured as when the patient has control of it.

As day after day these forcible methods are employed and the spine thereby rendered more supple, these means should be followed always by free, voluntary, educative work, when the pupil-patient must maintain by personal effort what has been

gained by forcible methods. A very determined effort must be made by the instructor and by the patient by all means that may be employed to carry the degree of correction to the utmost limit by this voluntary effort. At this point we have reached the most important part of physical training, namely, the stage of education.

Though physical training may be employed to correct digestive troubles, incipient affections of the lungs, obesity, chronic chorea, and many other diseases, yet I shall refer at this time to only one other.

Functional derangements are exceedingly common. Of the

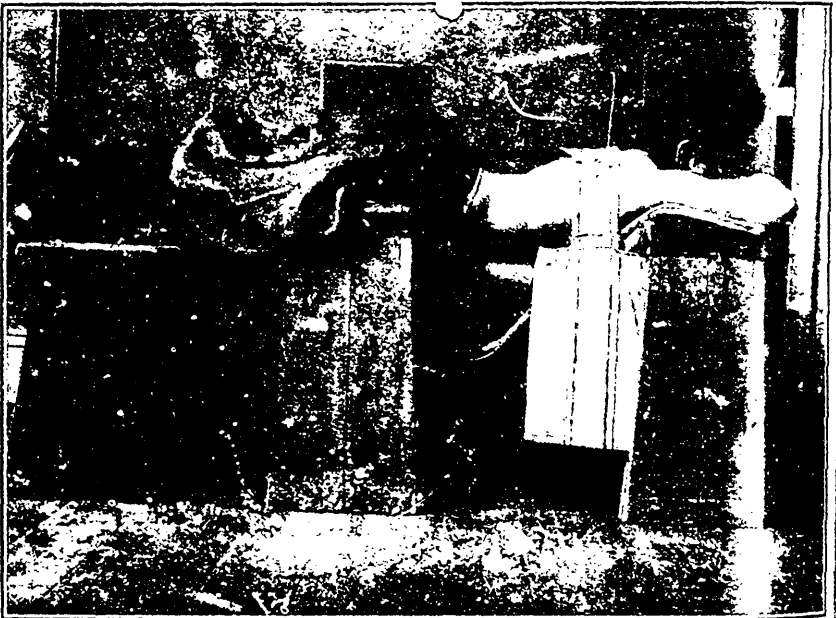


FIGURE X.
Weight applied to correct rotation.

various human ills to which the attention of the physician is called a very large portion have no organic basis. The term "spinal disease" is frequently employed where it has no definite and well-defined signification. Under it are hidden a large and varied class of functional disabilities which are exceedingly trying to the physician. They are due very largely to a lack of self-discipline on the part of the patient or to environment. The so-called "spinal irritation" is often spoken of and treated as if it were a lesion of the spinal cord and of its meninges, while in reality it is due to unhealthy and abnormal functioning of the higher centres. Such patients sometimes lead a life of in-

validism for many months or years, are taken about in wheeled chairs, or are found reclining on sofas, utterly unable, apparently, to engage in the ordinary activities of life. It is a very difficult matter, frequently, to determine what is simply functional and what is logically the consequence of organic disease. Assuming, however, that a correct diagnosis has been made, there are no means more ready and effective for the physician's use than the discipline and work which may be obtained in the gymnasium.

The "Weir Mitchell System of Treatment" marked a great advance in the management of such cases, but it is essentially passive; the active element is wanting. The patient is acted upon by drugs, diet and massage and by the will power and force of character of other persons; but little is done to call out or to educate the volition of the patient. She is kept in bed, secluded from friends who would show unwise sympathy, fed well, and given massage and rest. This method of treatment is called the "rest cure"; it falls short, inasmuch as it is negative in character. Systematic training to self-reliance and renewed confidence are needed to render the cure effective. Though the patient should seemingly regain health, it is soon found that life is not a negation, but that its problems must be grappled with in a positive manner and solved. The volition of the patient must be called into exercise. It is not so much a cessation of activity—mental and physical—that these unfortunates need, as it is that their energies should be directed in right channels, that they should be led not to think so much of themselves, but to centre their attention upon interests and aims outside of their own person, in a word, to beget in them and to cultivate a true altruism, and to suppress a corresponding, a debilitating egotism. The surroundings should be such as to arouse interest, new if possible, cheerful always, having an evident useful purpose, calculating to inspire self-confidence and to suggest personal responsibility.

While the general work done in the gymnasium is in itself helpful as a means of obtaining exercise and development, yet it is not chiefly for that reason that it is employed. The main desideratum is discipline and the creation of an ideal toward which the patient may reach, the establishing in each one a clear conception of personal duty and responsibility, and the confidence that application will reach the ideal and will insure that the responsibilities imposed by society will be met and borne cheerfully.

As a therapeutic agent, physical training has a much wider field than has yet been accorded to it. It is directly in harmony with the teaching upon which so much emphasis has been well laid in recent years, bringing into greater prominence physiological methods and affording natural methods a larger scope.

**A CASE OF ACUTE SUPPURATION OF THE MASTOID—LARGE
EXTRA-DURAL ABSCESS—SEPTIC THROMBOSIS OF THE
LATERAL SINUS—OPERATION, INCLUDING RESECTION
OF THE INTERNAL JUGULAR VEIN—RECOVERY.**

BY PERRY G. GOLDSMITH, M.D., TORONTO.

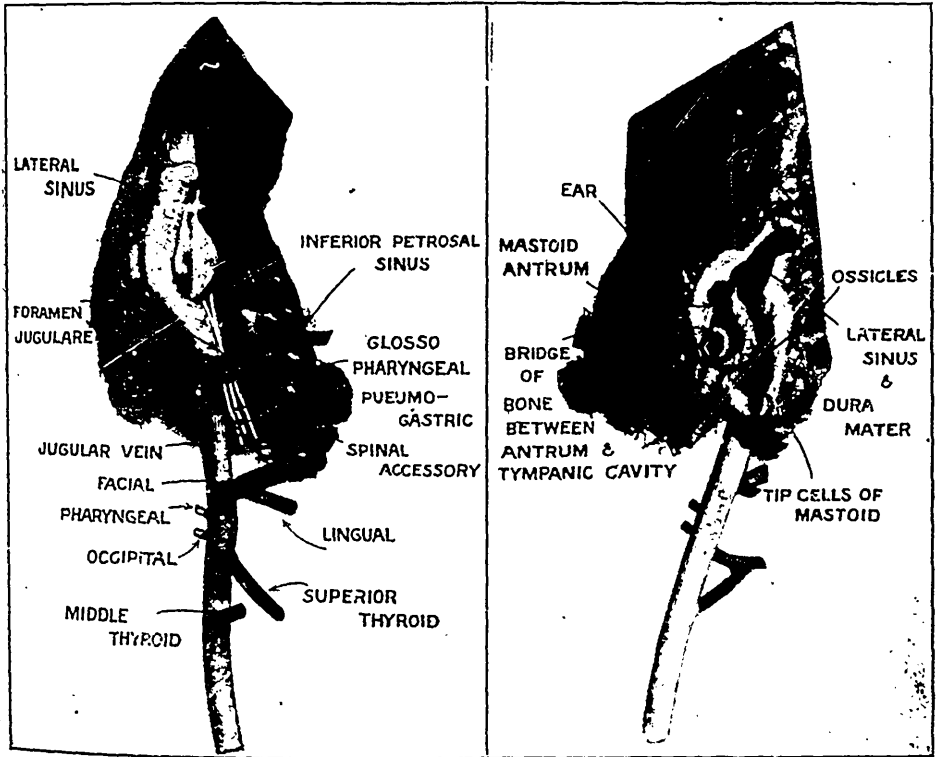
Mr. Chairman and Members of the Ontario Medical Association,—Permit me to present to you this morning the clinical history of a case which shows the seriousness of an aurial discharge, not only in its relation to the function of hearing, but also to general systemic infection.

All of you have had in your practice cases of discharging ears of short and long duration, which, with the exception of impairment of audition, have produced little or no appreciable effect on the patient. Some of you have seen the process advance acutely, and, after some varying lapses of time, to infection of the mastoid cells and dura mater, while few, I think I am safe in saying, have seen cases where not only the mastoid cells, lateral sinus and meninges were involved, but when the infection has passed into the jugular bulb and general circulation, producing a general septicemia.

The case I present to you comes under the latter classification, and illustrates well Sir William Wilde's saying, "When a discharge from the ear exists, no one can tell how, when, or where, it will end, or to what it may lead."

Miss A. R., aged 27, patient of Dr. Bascombe; family and personal history unimportant. On the 17th of February, 1907, felt chilly and went to bed with a sore throat and some fever and thought she had tonsillitis. On the following day a severe throbbing pain came in the right ear, followed in four days by free purulent discharge and complete relief from pain. The discharge continued for the next three weeks, associated with pain radiating over the right side of the head and felt most acutely behind the ear. During this time she was in bed only periodically, and her temperature ranged around 99 and 100. She was rapidly losing weight and presented the appearance of a very sick person, with feverish spells and occasionally chilly feelings. During the third week in March she had a very severe chill, followed by profuse sweating. Another chill with temperature after the chill of 103½ followed in four days. Vomiting occurred after the chill, and the sweating had now become quite constant. The pain varied in intensity and at times was very severe, for which she used morphia tablets. I now saw the

patient for the first time. There was a very profuse discharge from the ear, much more than could be secreted by the tympanum alone, and some, though not very marked mastoid tenderness. There was no edema or stiffness of the neck. Temperature $101\frac{1}{2}$, pulse 120, respiration 22. Operation was at once decided upon. The mastoid was found full of purulent pus, showing that there was already a considerable exposure of the dura. The antrum lay very high and was associated with quite a shallow



middle fossa. All diseased bone was removed, and the lateral sinus thoroughly exposed. The vessel wall appeared healthy and there was a noticeable slight pulsation. The posterior bony part of the external auditory canal was removed down to, but not including the bridge, as is advised in the *Heath* operation. The lateral sinus was not opened, as it was considered that all the symptoms might be caused by the condition found in the mastoid. That evening and the next day the patient progressed very nicely, but in the next evening the temperature gradually rose to 102, and then 104 3-5, with a marked chill, profuse sweating and pulse 148.

The wound was unpacked and the bone cavity appeared healthy. The dura appeared to bulge very considerably. I aspirated a small amount of serous exudate through the dura, which was subsequently found sterile. The lateral sinus showed no fluid blood on aspiration, but as this is a very fallacious sign, I did not rely on it. The case now seemed to be quite clearly one of lateral sinus thrombosis, with infection through the jugular vein. The patient was given an anesthetic again, and the lateral sinus opened—a soft, semi-fluid, yellowish clot was found. The bone was removed for about $1\frac{1}{2}$ inches upward and backward towards the torcoli, and the clot was found to have extended further, as no bleeding occurred on curetting the clot. The semi-fluid clot was also found to extend well downward to the jugular bulb, and could not be safely reached to its extremity with a curette. I thereupon decided that in order to give the patient any reasonable chance for recovery it would be necessary to stop any further poison from getting into the circulation. The neck was then carefully cleansed—brisk rubbing might dislodge a piece of clot—and the jugular vein reached just above the inner end of the clavicle and ligated just above the point where it is joined by the subclavian. I intended following the vein upward, and ligating as near its exit from the skull as I could, but the patient's condition demanded an early cessation of the operation. The vein was then tied just below the facial and the intervening piece removed. It was not hard or cord-like in this part, and I was then evidently below the clot. The neck wound was flushed out and sewn up with a cigarette drain in the upper end. The lower end of the remainder of the vein was not opened, nor was it flushed through from above, as I would do on another occasion. The sinus above was thus cleaned of clot well back until a free flow of blood occurred and this end packed. The lower end was also cleaned, but no bleeding ensued, showing the inferior petrosal sinus was also thrombosed, as well as the posterior condyloid vein. The subsequent history gives little to record. On the sixth day I wished to remove the stitches in the neck wound, but owing to the very low state the patient was in no evidence of healing had taken place. The two stitches which were removed allowed the incision to open just as though it had only been sutured, and did not even bleed. The patient's temperature came down at once to 99 and 98 3-5, with a very much slower fall in the pulse rate. The healing has been uneventful and without any irrigation. There is no discharge from the ear and her hearing is quite normal. Owing to the adoption of Heath's method, I was able to clear out the middle ear of mucous and pus by inflating through the auditus, and the very excellent hearing my patient has bears out Heath's statement that its greatest value is in the saving of audition.

I wish to present some prepared temporal bones, which show the extent of the operation, as well as the lateral sinus jugular vein and its branches.

DISCUSSION.

DR. PRICE BROWN.—Congratulates both gentlemen on the excellence of their papers. Dr. Goldsmith's case has been followed by excellent results with regard to the hearing of the patient, being much better than usually follows so severe a mastoid operation. I would like also to emphasize what Dr. Royce has said about the advisability of free and early operative treatment of the drum membrane in cases of suspected mastoid disease; when incision of the drum membrane is required at all it shall never be by mere puncture, but by free incision of such a nature as to produce free drainage. As an illustration of this I mention the case of a lady referred to me lately as suffering from mastoid disease of such severity as to call for immediate operation. I found a tense drum membrane and freely incised, with free discharge of pus. Washed out regularly with boric acid for several weeks, resulting in complete healing, without mastoid operation.

DR. WISHART.—Did not understand cause of operation on jugular vein in Goldsmith's case. The symptoms of thrombosis seemed to be absent, and if it were present, the operation was insufficient. The paper of Dr. Royce was a masterly exposition of a very interesting subject, and the author to be congratulated. The diagnosis of these cases is often a matter of difficulty. The so-called cardinal symptoms not to be relied upon. Increased experience means decreased trust therein. The majority of his adult cases in the past winter had presented none of these—swelling, congestion, and if tenderness, only at the posterior part of the tip. Had found leucocytosis of some use.

DR. G. S. RYERSON protested against promiscuous opening of mastoid in acute disease. Free leeching, draining of middle ear will often relieve. He believed that the radical operation was too often performed, but in proper cases the results were most satisfactory.

DR. GOLDSMITH'S REPLY.—Referring to possibility of return flow being set up in the post-condyloid vein and inferior petrosal sinus by ligating the jugular, it must be remembered that no return flow of blood occurred in the patient after opening into the bulb, which probably would have occurred had these not been thrombosed; furthermore, according to Dr. Hugh Jones at the recent B. M. A. meeting, the peculiar means of joining by a slit-like orifice of the inferior petrosal with the jugular practically eliminates all danger of return flow. Cord-like feeling in the jugular vein is practically never found, and need not be considered as an indication. The case was one whose clinical history was typical

of those cases of jugular bulb infection in which resection of the vein is *imperative*. *The indications for ligating the vein were very clear; in fact, no symptom at all was lacking*, and from the symptoms present I would have been quite justified in tying the vein before opening the mastoid. As to the operation being *insufficient*, I think the unusually extensive operative procedure employed and the result secured speak for themselves. Dr. Ryerson spoke of the necessity of conservatism, and not too much eagerness to operate on the mastoid. I agree very heartily with this, and with him would rather cure my patient by simple measures directed to the cause than graver operative procedures.

TREATMENT OF FUNCTIONAL NERVOUS CONDITIONS—
WITH REFERENCE TO CASES.

BY WILLIS S. LEMON, M.B.

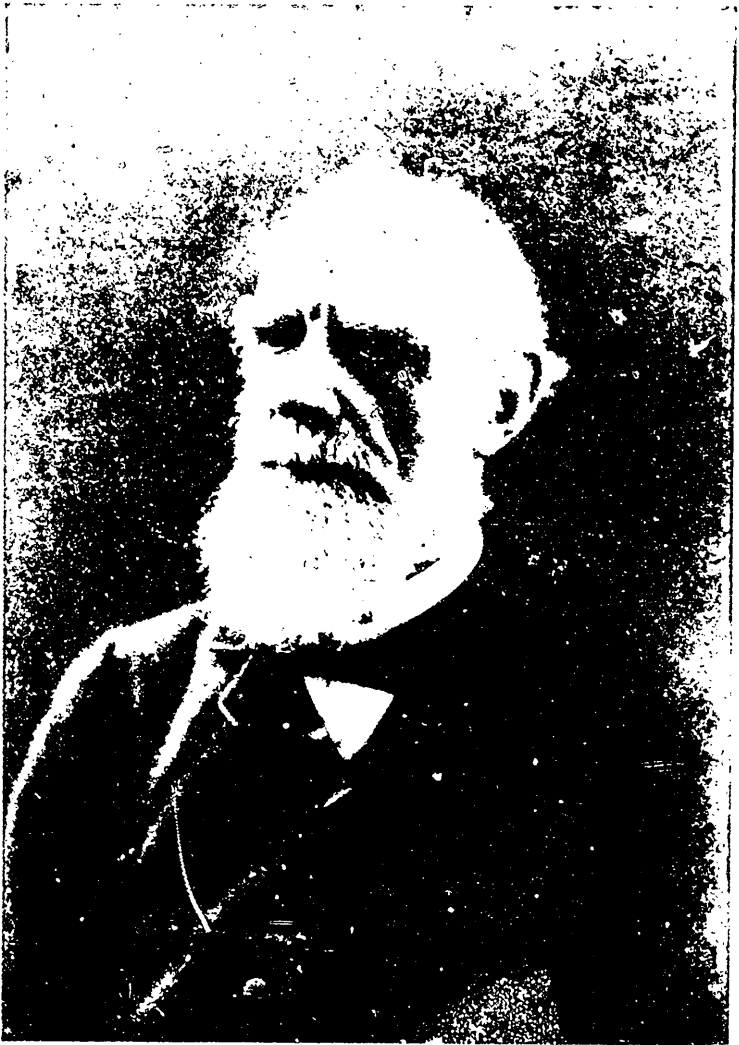
WITHIN the last few years much thought and energy have been expended in the creation of a rational treatment of these curious cases resulting from weakness or exhaustion of the nervous system and presenting a most motley group of symptoms, affecting almost every system and organ of the human body—so complex, indeed, that for many years patients so suffering were looked upon with not a little misgiving, or with even open distrust. Men formerly believed these cases, in which no real organic basis for the symptoms complained of could be discovered, were in reality the result of the conscious will of the patient and thus called for no sympathy, and of consideration regarding treatment and succeeding cure little or none at all.

The terms neurasthenia and hysteria were regarded as synonymous with fraud and malingering. But now we are sure that the conscious mind cannot bring about the vague discomforts, the incessant weariness, hyperesthesia, anesthesia, limitation of usual fields or rise of temperature, or swollen, hot and reddened joints in exact simulation of organic disease, and we can be equally certain that the areas of hyperesthesia are tender and that the pains and aches, the discomforts and terrors complained of, are as real, and even more trying, than if organic disease were really present to call them forth. It is because of the soundness, in my opinion, of that reasoning and because I am sure it is the only workable premise upon which to base a foundation for a rational treatment, that I have chosen the "Treatment of Functional Nervous Disease" as the subject for this paper.

I have been helped toward this belief very largely by the study of a series of cases in the nervous wards of the General Hospital—the establishment of such being in itself an evidence that men had, years ago, even, adopted the faith and, believing firmly, had worked untiringly and with discouragements known only to themselves until their establishment, when rational treatment—or at least rational as far as our present knowledge teaches—could be carried out with hope of cure.

It was while in charge of these wards that I saw many real recoveries.

The plan of treatment, varied, of course, to suit the particular patient, is that suggested by Dr. S. Weir Mitchell—of which Osler remarks, "The remarkable results obtained by this method are now universally recognized." It is one now quite well known to



LORD STRATFORD.

the profession in America, has been discussed favorably at the British Medical Association meetings, endorsed in the Old Land by such men as Playfair and Ross, and accepted on the Continent.

Among the first cases studied was S. L., a woman—62 years of age, who gave the following history: Patient came to the hospital on Sept. 9th, complaining only of depression and extreme weakness. Her family history was without stigma of mental disease and only one member of her own family had even suffered from “nerves.” She had been a perfectly healthy and normal child and girl, and had continued so until after her marriage, when two miscarriages in quick succession, seriously undermined her general health. She became depressed and despondent, and since then when physically weakened these symptoms have returned. For this reason she came as rather an unfavorable case, since most can be hoped from the early acute case. Two years ago she had another acute attack which took her some months to recover from, and left her even more weakened than before. During each of these her condition was one of deep despondency associated with severe headache. Last spring she had recovered, but as the summer came on she became more irritable, was worried over trifles, lost her appetite completely, was sleepless and emotional. She cried a good deal over nothing in particular, grew very thin as her despondency increased, lost interest in her surroundings and in her family and even in her own recovery, of which she quite lost hope. She gave up work in August and had neither the desire nor the strength to exert herself in any way. On admission she said she felt depressed, that her memory was going, that she felt weak and languid, especially in the morning, and had no desire for food. The mental process seemed slow and events, though recalled, were done so only after effort.

On examination no organic lesion could be discovered. The treatment adopted in this case was as follows:

Chemical.—The bowels were cleared thoroughly with calomel, grains ii., given in half-grain doses, followed by soda phosphate, drams ii., in the morning, and they were kept active by the use of cascara or A. B. S. & C. pills, which in the experience with these cases, have been found probably the most satisfactory laxative.

With these cases where there is torpidity an intestinal antiseptic consisting of bismuth, B. naphthol and salol, each grains v., is given three times daily, and in this case a tenth of a grain of calomel was added. Just what benefit is derived from the use of this remedy I cannot say, having had too few cases to generalize. Bromides—the sodium salt in doses of grains xv. to xx.—were administered along with small doses of liq. arsenicatis, which acts as a tonic and also prevents the occurrence of the unfortunate bromide rash which, besides being harmful in itself, so frequently



LORD MELBURN'S RESIDENCE, MONTREAL.

causes the patient to become discontented with the treatment and so reacts seriously on the psychic element, that must enter into the treatment of all nervous conditions.

Later, during October, she was given a tonic mixture containing iron and quinine. But not so much stress is laid upon the chemical as upon the physical treatment, comprising food, electricity, baths, etc.

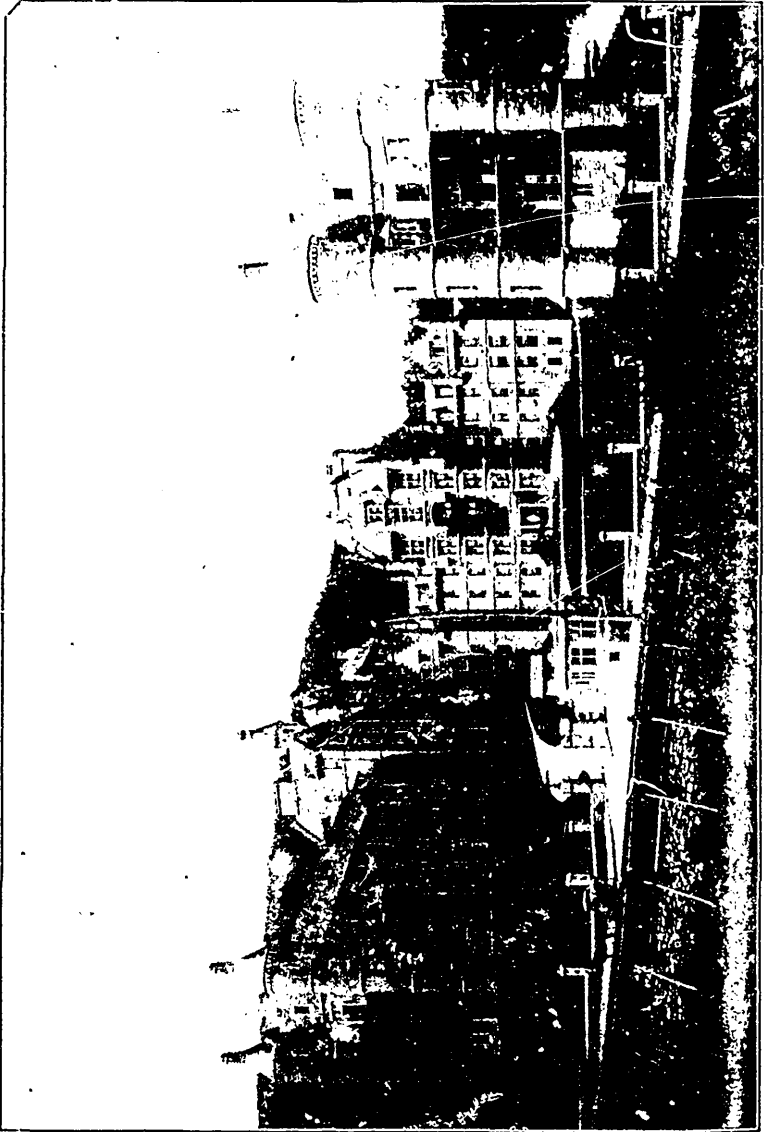
Food.—Patient was given the routine dietary, varied, of course, as her particular condition seemed to demand. Gradually her dietary was cut down from full to light, and then milk given between meals to make up for the withdrawal of solids. This was increased in amount and frequency of administration, till by the third day she was given only milk and was taking from six to ten ounces every two hours. In the mornings she was given an orange so long as the rigid milk diet was continued. This was kept up at regular intervals and was always taken slowly, sipped in mouthfuls, and at times lime-water added, if the digestion became more than ordinarily impaired.

Apart from the case in hand it was found that (especially in case of J. H.) buttermilk, barley or rice water, added to milk, could be substituted with benefit for variety's sake. We never gave the children's foods, such as malted milk or Nestle's food, etc., as suggested by Weir Mitchell.

Usually the exclusive milk diet is supplemented after about the twelfth day, but in this case it was continued for double that time because of intercurrent bronchitic attack. She was then given, for breakfast, in addition to milk, gruel or porridge and a cup of milk coffee. For dinner, broth, biscuit and custard, in addition to milk, and for supper, a milk-broth and biscuit, followed by ice-cream and jelly.

Usually, by the fourteenth day, a thin slice of bread and butter may be added to each meal, and for dinner, scraped beef, chicken or fish, with celery, lettuce, etc., the addition for supper.

Diet was then gradually increased until by the next week full diet was being given. The patient's diet time-table, then, could be expressed thus: Breakfast, 8 a.m.; milk, ounces viii., 10.30 a.m.; dinner, 12 noon; milk, ounces viii., 2.30 p.m.; supper, 5 p.m. Egg-nog, oyster, egg, egg-chocolate, etc., were now substituted at times for the mid-meal milk. With none of the cases treated in the nervous wards was malt extract used, as Mitchell recommends, and in only one case, Miss H., was the patient fed by the nurse, though this is also deemed a necessity by the above author. He also uses, on occasion, whisky in milk, or a glass of dry champagne as an adjuvant, thus increasing the capacity to take food. This has never been resorted to in treatment of cases in the hospital wards.



ROYAL VICTORIA HOSPITAL, MONTREAL.

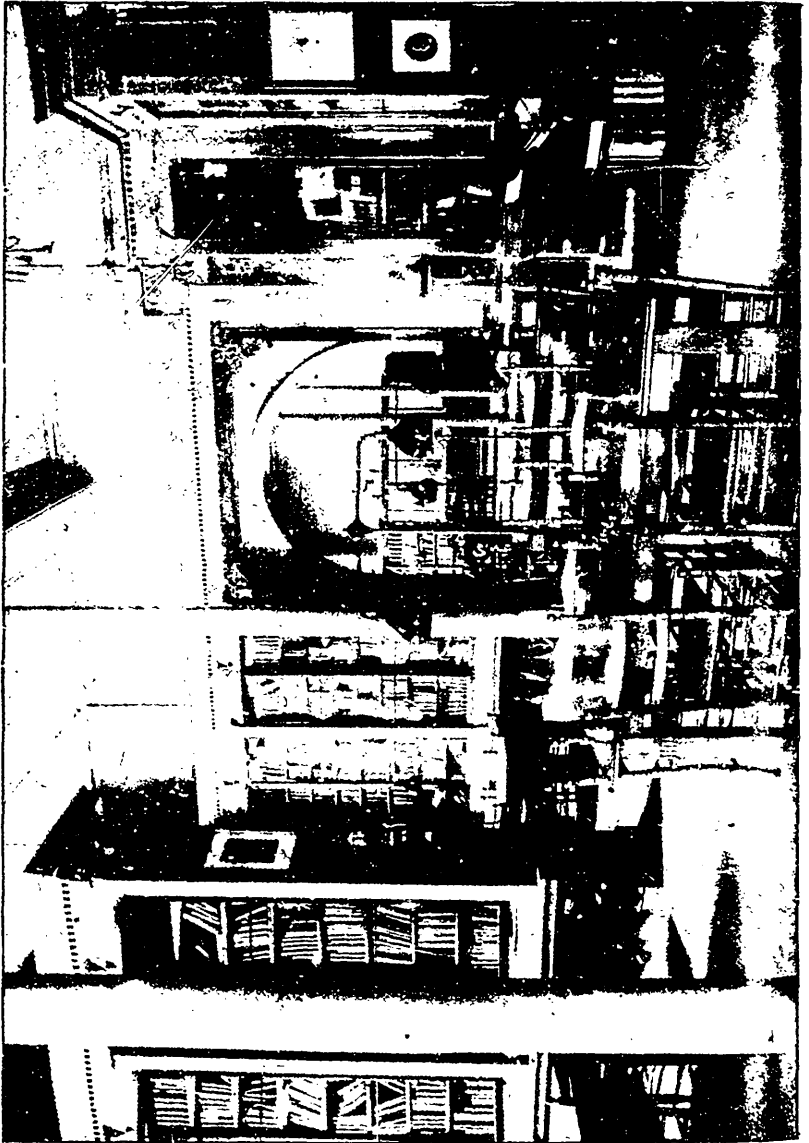
In comparison with the diet list given for patient above, the following is one of Dr Mitchell's schedules: Iron and malt, breakfast (chop, bread and butter), milk, ounces viii., at 8 a.m.; soup at 11 a.m.; iron and malt, dinner (anything), champagne, ounces vi., milk, ounces viii., at 2 p.m.; soup at 4 p.m.; malt and iron, bread and butter, fruit, milk, ounces viii., at 7 p.m.; soup at 9 p.m.

Electricity.—With this case Faradism for forty minutes each day was continued throughout the whole stay in the hospital. The galvanic current was never used, and, having no experience with it, I cannot speak of its benefits. With the Faradic the whole body is treated. Starting at the feet, one leg at a time is treated, then the abdomen and chest, followed by each arm in turn. The patient is then turned on the face and the back treated—especially the spine and backs of the legs. The patient found this to rest and make comfortable the aching and soreness that frequently settled in that area.

Baths.—The patient was given each morning a tepid bath, followed by a spray, each at 103 deg. temperature, the spray being gradually lowered to cold. With female patients a rubber cap was always worn.

Mechanical Treatment.—Comprising massage, exercise, rest, etc.

Massage of the whole body except the face was done daily, generally in the forenoon, and lasting for forty minutes. This was always done by the nurse in charge, or under her supervision until any of the younger nurses became experienced enough to do the work alone. Apart from the present case, I think one patient should always have the one nurse who seems most suited to her case, and that that chosen nurse should have exclusive charge of the patient. Changing from one to another, even though professionally there may be no choice, does no end of harm and may even prejudice any chance of success. Some are peculiarly adapted to certain cases, and though all should, as Osler says, be "bright, intelligent women," with few nerves but much controllable sympathy, rather better demonstrated than otherwise expressed, yet there is, no doubt, a peculiar psychical effect produced which reacts for good or does incalculable harm. This influence lost, however, one *must* change the nurse. Weir Mitchell says: "One of the questions of most importance in the carrying out of the treatment is the choice of a nurse. Just as it is desirable to change the home of the patient, her diet, her atmosphere, so also is it well, for the mere alternative value of such change, to surround her with strangers and to put aside any nurse with whom she may have grown familiar. As I have succeeded in treating invalids in their own homes, so have I occasionally been able to carry through cases



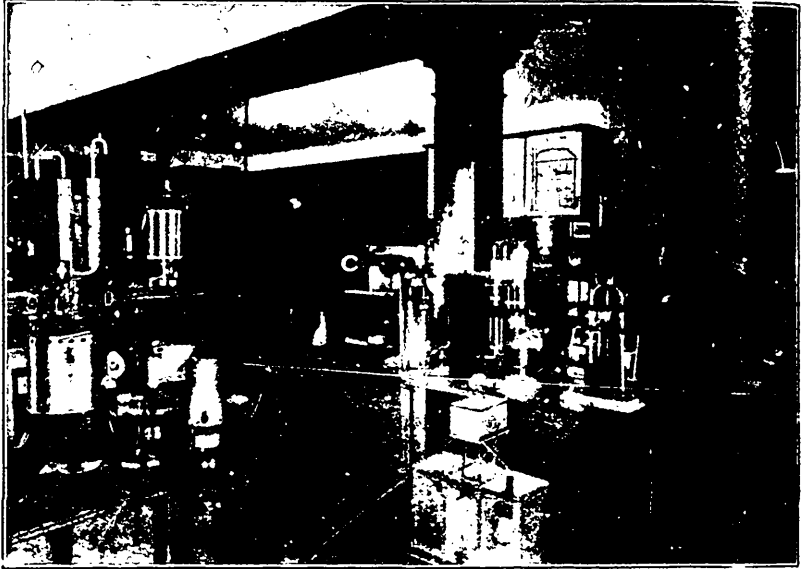
nursed by a mother or sister or friend of exceptional firmness; but to attempt this is to be heavily handicapped, and the position should never be accepted if it be possible to make other arrangements. Any firm, intelligent woman of tact, a stranger to the patient, is better than the old style of nurse, now happily disappearing." To find the congenial as well as the suitable, from a professional viewpoint, becomes one of the physician's hardest problems.

But to return to the case in hand. After the first day in the ward, no visitors were allowed for the next three weeks, when her husband and her daughter were allowed to call once a week for a five to ten minute visit. The patient was never confined to bed in a separate ward, but, like so many others, she was not at all upset by strangers, though much so by those of her own family—possibly because she was led back again to think in channels that had helped cause her breakdown, or the old associations, worries and cares, imaginary though they seemed to others, yet real enough to her, were recalled. After the four weeks were up and her recovery assured, she was allowed more liberty—to read and to write, to receive and to send letters, and to entertain visitors.

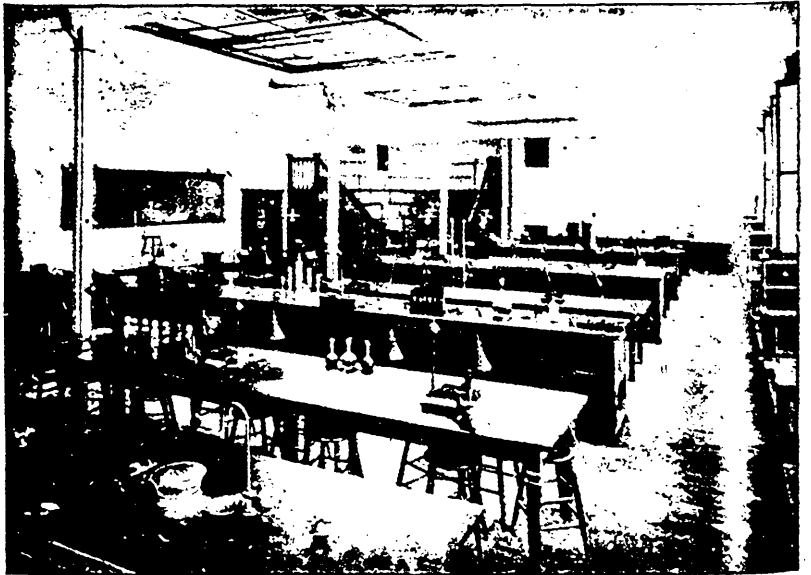
This, then, would be about the routine of her life after the first three weeks of bed and seclusion were over: 6 a.m., milk, ounces viii., cold or hot, or other fluid; 7.15 a.m., up, bath and spray; 7.30 a.m., back to bed till breakfast; 8 a.m., breakfast in bed, rest and sleep, or entertainment with books, pictures, etc.; 9.30 a.m., massage for forty minutes, sleep after massage; 10.30 a.m., milk, rest and entertainment till dinner; 12.30 a.m., dinner, rest for an hour; 1.30 p.m., Faradism for forty minutes; 2.30 p.m., fluids, milk, etc., verandah for 1½ to 2 hours, exercise; 5 p.m., supper, bed till evening; 6.30 p.m., alcohol rub, bath or cold pack if necessary for sleep, massage of tender spots, etc.; 7.30 p.m. to 8 p.m., lights out.

This case made marked progress and was perfectly well on leaving the hospital, having regained her old standard in weight with a hemoglobin register of over 80, in good spirits and in every way a perfectly normal woman. Months later, when seen, she had remained well, or if anything had improved. As this case illustrates the type, the nervousness from oncoming age and weakness, the following will illustrate the case so frequently met with, the nervous from childhood, having inherited the "neurotic diathesis."

C.A., a bright, intense young man of 25 years, following an occupation demanding hard, nerve-exhausting work, and no manual work of any kind; one who had studied his own case and could talk learnedly concerning his trouble, saying, for example, that he suffered from instability of the nervous system, inability to think consecutively or to concentrate without excessive exhaus-



LABORATORY OF HYGIENE, M'GILL UNIVERSITY.

LABORATORY OF PATHOLOGY AND BACTERIOLOGY, M'GILL
UNIVERSITY.

tion. He was the product of neurotic parents, who had given him as an heritage an exhausted capital of nervous energy. Pampered and petted as a child, with every whim indulged or wish anticipated, he found himself unable, when he grew to be a man, to cope with the daily cares and the work of a profession, most unwisely chosen, because of its demands, particularly upon the man's nervous energy.

Coming to the hospital after having already suffered twice from exhaustion, he presented about the most difficult case one can have to deal with. Possibly had he been fat he might have been somewhat a more hopeless case.

He was placed upon the routine treatment already described, but kept in bed for a month, the last week only with the greatest difficulty. Such a case, I believe, cannot be treated by routine. For two weeks he was so exhausted he was glad to stay in bed and in a separate ward and to accept the routine described, but after that he began to fret for more liberty and might, perhaps, have made a better recovery had he been allowed it. As it was, he quite lost control of himself, became emotional and even hysterical, until placed on the verandah, after which his recovery was rapid.

Such a case, I think, is the better for the routine, but should be hurried along as soon as the physical exhaustion is over, given liberties, such as reading and writing, and some exercise, such as the dumb-bells or clubs afford, and, though allowed few visitors, especially friends, should be entertained and soon allowed to entertain himself. This is the kind of case, beyond all others, where the physician's own personality counts for most. Above all the patient must have confidence in his physician and must know that much of his improvement depends upon his own co-operation, and that most probably it must be extended over a length of time.

Almost always we get such a case just a generation too late for successful work, but it is the one class which most of all one can do good prophylactic work. These are they who from infancy even should be submitted to what Osler calls "psychic hardening," and the strength of the body encouraged even at the expense of the brain. The tendency to become "boy orators" or "infant prodigies" is strong here and should be absolutely discouraged, and if necessary the child removed from the care of the fond and proud but emotional, capricious and incapable parent.

C. A.—Improved in health and strength, and was advised to give up his work and to spend his time for a while at least on an ocean trip, when it was hoped the bracing air and change of scene would complete the cure. He left us better probably than he had ever been in his life, but I have heard since that the advice given was not followed and that he was again a patient in an hospital.



BONAVENTURE DEPOT, MONTREAL.

The third class of case is well illustrated by C. B., the type of those whom overwork and strain has at last broken down a strongly resisting nervous system, and they surprise themselves and even disgust themselves when they find they are unable to do their routine work.

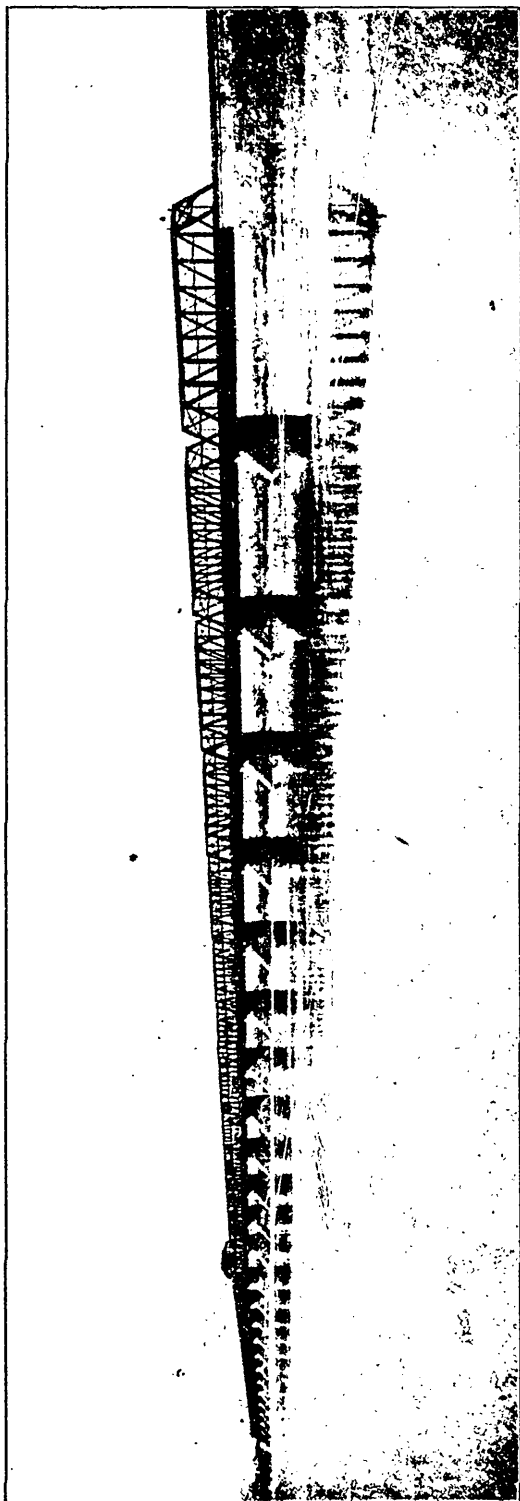
C. B. was a strong, vigorous woman, without "nerves" to speak of, one of those who look rather without sympathy on anything emotional. For years her independence kept her at business, where she undertook even more than her share of responsibility, and besides this, her superfluous energy and conception of duty found vent in church work among the slums of the city in which she lived. Everything she did was always most conscientiously and perfectly done, and for ten years, without sign of wear. Last summer she became more easily tired and more than ordinarily reduced in flesh, but her holiday in the country improved her condition and she came back to renew her work with her old-time vigor. This spring, as the press of work came on, she began to lose interest, grow tired and a bit melancholy, but did her work, till one day she surprised herself by starting to weep for no particular reason, and was unable by exercising her strongest will to stop. This continued for days. She lost her appetite, could not sleep, and dare not trust herself to do her work.

C. B. was not given institutional treatment, though I think two to three weeks would have helped her a good deal. She was sent to the country and advised to carry out the following routine of treatment:

Chemical.—Bromides for three to four weeks; Easton's syrup, dram i., t.i.d. p.c., though in most such cases the elixir glycerophosphates acts even better. In this, however, it was felt that the case was too urgent for the milder tonic. She was not prescribed either isolation, massage, or faradism, but was given the diet prescribed for the third week in Case 1, with the intervals of rest in bed—the rest of the time to be spent in the open air walking or riding or driving, or any other light exercise that stopped short of actual fatigue. Salt baths each a.m. were prescribed, with addition of warm bath at night if sleepless. To this class belongs the business or professional man not naturally neurasthenic but overdone by the strenuous life and demands of present-day business.

These are probably the most hopeful of all cases, and frequently do not demand—as the case quoted did not—institutional routine treatment. For them it may be sufficient to enjoin absolute rest with change of scene and diet.

These are, I think, the three great classes, and I have attempted to outline their general treatment without going into the care of particular emergencies that may arise or of particular organic symptoms, such as the multitude of confusing pains referred to



VICTORIA JUBILEE BRIDGE, MONTREAL.

the various organs of the body. No rule can be laid down for them, and one must trust to one's own originality and resource to deal with them. In only two cases, however, speaking of hyperesthetic spines, etc., was it necessary to discontinue the use of massage or faradism, and with us tapotement is practiced as well as the rubbing and stroking motions. Faradism, the cold baths, Scotch douche, etc., and massage, are discontinued with female patients during the menstrual period.

IN SUMMARY.

Seclusion.—One need add only this: 1. That it is in most cases an absolute necessity. It becomes needful to disentangle them from the meshes of old habits and to remove them from contact with those who have been the willing slaves of their caprices, for sure enough where there is one there are likely to be made two who will suffer together. It is useful as a prophylactic measure, as well as an active.

2. It should be borne in mind that each case must be treated individually, and therefore studied on its own merits. Thus no regular length of time can be arbitrarily laid down. Some patients do well for a longer, some on a shorter time, and if one can generalize at all, women stand the ennui of rest and isolation better than men.

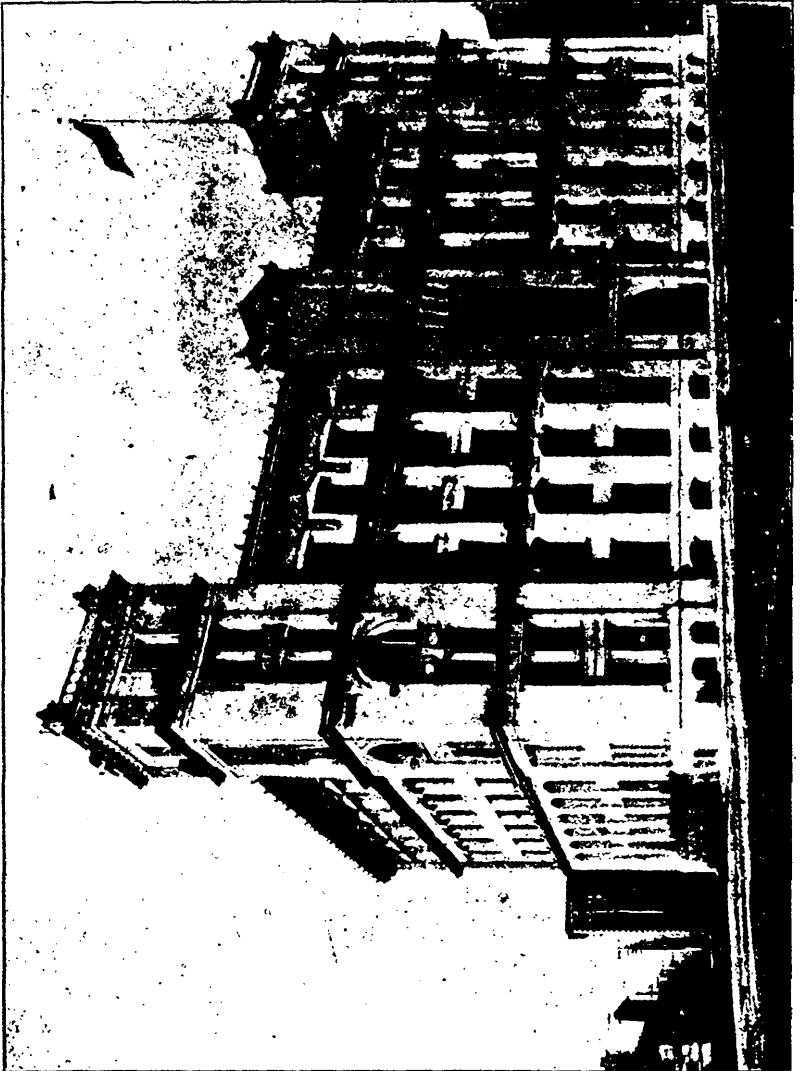
3. As pointed out before, seclusion is not essential, though it may do no harm for those who fall in Class 3, the broken down, feeble, thin, and possibly anemic, from overwork and exhaustion.

4. It is not good for those "happy invalids" unless it be made absolute—no reading, no writing, no letters, no visitors; and as few calls as possible by nurse or physician; in fact, let it be made anything but a pleasant pastime, such as they would enjoy.

Of rest one can say much the same thing. When to prescribe rest and when exercise is the big question. It is probably safe in most cases and imperative in others. For example, Case 3 could not have been made walk.

For those who deceive themselves into the belief that they really cannot, but whom you are sure can if they will, it sometimes is of immense value in discipline to make them see how much they can do if they are made to will. And herein lies the value in large measure of institutional treatment—relieving those of worry who try and will, but haven't the muscle to act, and stimulating those who have the latter but not the will to make their strength of use. To the former rest often brings a sense of relief, and many times in itself causes a disappearance of the especial pain that has caused anxiety.

One should be able to order out of bed as well as order to bed, but one must prepare the muscles of the body for the change. The



GENERAL OFFICES, G. T. R., MONTREAL.

preparation does good; it stimulates hope and assures of progress.

Thus, pass from general massage to passive movements, then to resistive movements, and then to gentle gymnastics later. This to correspond with the three steps: sit up, sit out, walk out. The harmful effects of rest are overcome largely by mechanical means—massage and electricity.

Massage supplies the muscles with exercise, they do not lose tone during rest; the circulation does not become torpid, and thus no storing up of the products of wear and tear throughout the muscular system takes place. It raises the surface temperature, increases the bodily secretions at the time—especially the urine, in cases where abdomen is thoroughly treated—slows and steadies the pulse and, as I have found, substantiating results made known long ago, increases the hemoglobin and the red count.

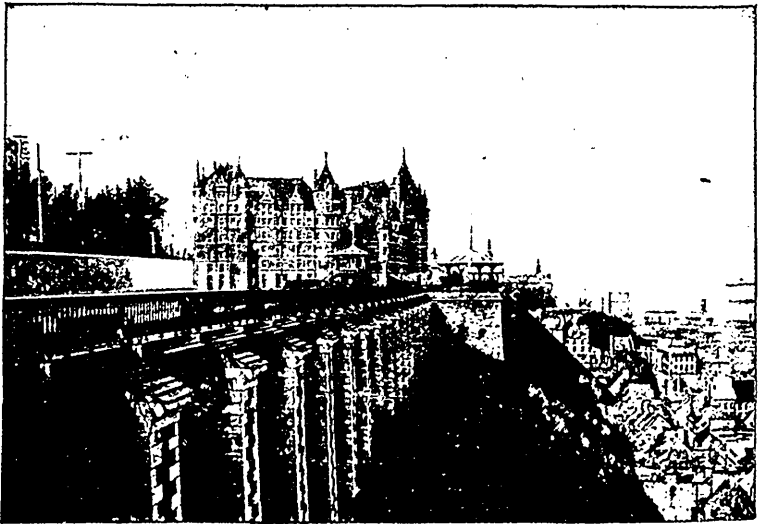
Besides this, it soothes pain in many cases and will almost always induce sleep, and, moreover, acts, as does electricity, as a strong psychic influence, assuring the patient that much is being done for his benefit.

Of drugs, besides the bromides and the tonics before mentioned, I have had little or no experience and can say nothing. We used *asafetida*, the *valerianalis com. indica*, *belladonna*, *tr. opium*, etc.—not *morphia*—but got no results to form conclusions from, probably because the cases experimented upon were suffering from a true psychosis rather than a functional condition. Psychical treatment was never tried deliberately, and so, from personal observation, I know nothing of the results from suggestion direct, or of such rather risky therapeutical adjuvants as hypnotism.

In conclusion, much depends upon the man himself, as may be gathered from what has already been said. No method is perfect in every man's hands, and no man can hope to treat all classes of cases. One using his methods may succeed brilliantly where he fails. Yet any one of us, using as true a blend as we may of natural demonstrated, but not demonstrative sympathy, with firmness and common sense and good judgment, may do much to help and to cure this very deserving class of patient.



PLACE VIGER HOTEL, MONTREAL, CANADIAN PACIFIC RAILWAY.



CHATEAU FRONTENAC, QUEBEC, AND PART OF LOWER TOWN, C.P.R.

THE NECESSITY FOR ISOLATION HOSPITALS FOR SCARLET FEVER, DIPHTHERIA AND MEASLES.

BY J. A. CASSIDY, M.D., TORONTO.

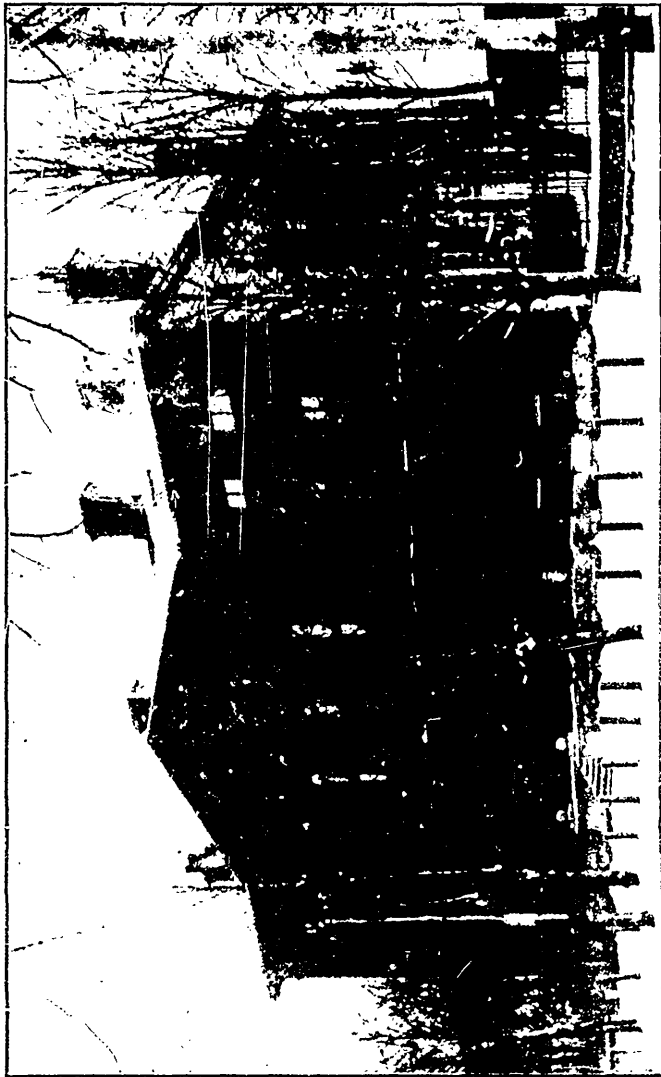
To begin at the beginning, the primary object of isolation and disinfection, in the treatment of infectious diseases, such as scarlet fever, diphtheria and measles, is to prevent the extension of infection to the well.

While keeping this object in view, no effort should be spared by a sanitary authority to promote the hygienic interests of the isolated patients and to assist in their recovery.

Though not looked on with so much terror as smallpox, scarlet fever is dangerous to life. From the Canadian decennial census of 1901 we learn that during that year 1,101 deaths were caused in Canada by scarlet fever, whereas the mortality from variola and varioloid was only 45.

The poison of scarlet fever is due to a special organism, as yet undetected. It is of great vitality and retains its infecting power for at least one year. The bearer of the contagium is in all probability the desquamated epithelium of the infected persons, the disease being communicable to the greatest degree during desquamation. The poison is disseminated by the scaly particles in the air, on clothes, and other fomites, in food, such as milk, etc. Usually infection takes place through the respiratory tract, but may be introduced through the digestive tract. The required isolation in such a disease is best carried out at a special hospital. In the absence of such an hospital, isolation is enforced, if at all, at the patient's home. Room and house quarantine are usually difficult or impossible of enforcement, especially among the poor, and the foci of infection are often indefinitely increased by the visits of friends and neighbors. In an isolation hospital, however, where egress and ingress are under control, where facilities for the disinfection of discharges are at hand, the danger of scarlet fever spreading is reduced to a minimum. It should be borne in mind, also, that if a case of scarlet fever is treated in a private house, adults living therein, though they rarely take the disease themselves, may convey it to others, after but a momentary exposure. Besides, children or teachers living in a house where a case of scarlet fever is treated are by law debarred from attending school. Again, the isolation of a scarlet fever patient in a private house may be complete enough, but the isolation of the other members of a family of young children, or even of adults, is difficult and productive of hardships, especially for wage-earners. When treated in private houses scarlet fever causes more trouble and anxiety to health authorities than small-

* Read at the annual meeting of the Ontario Medical Association.



PROVINCIAL BUILDING, HALIFAX, N. S.

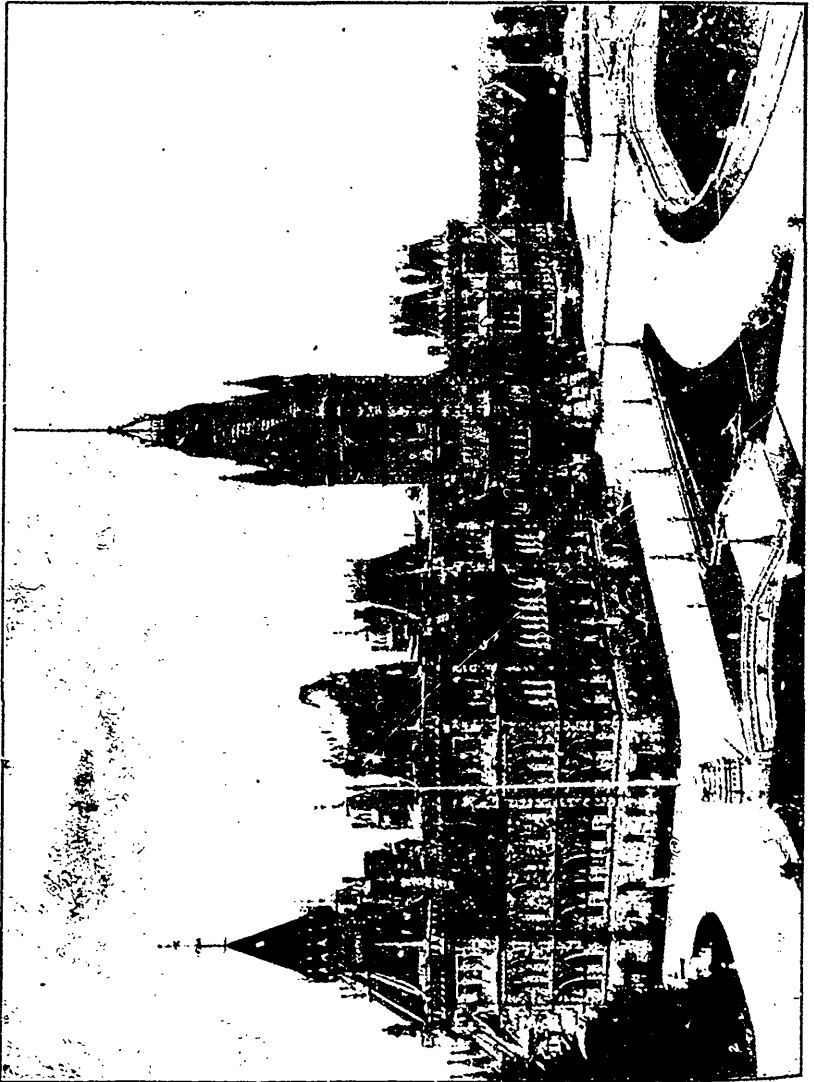
pox. Should a case of smallpox appear in a private house, if the other members of the family have recently undergone successful vaccination, if their clothing and other effects are disinfected and they are kept separate from the patient, little or no danger to them or others is apprehended. Good hygiene, of course, requires that smallpox suspects should be kept under observation for a time equal to the period of incubation. As there is no vaccination against scarlet fever, efforts to protect persons not immune to it involve excessively minute precautions, difficult to enforce and liable to be defeated. Hence the obvious conclusion that, in the interest of all parties, scarlet fever should be treated in an isolation hospital.

Diphtheria is transmitted chiefly by direct contact between an infected person having diphtheria bacilli and an uninfected, well person. Childhood (between three and six), defective drainage and catarrhal conditions of the throat, are predisposing factors. The poison is contained in the secretions of the throat or nose and may be transmitted through the atmosphere or fomites. The exciting cause is the Klebs-Löffler bacillus, which is found only in the membranous exudation. The constitutional symptoms result from the poisons generated by the bacillus. The statistics of the Canadian decennial census of 1901 show that 1,224 deaths from diphtheria and croup, 1,982 from diphtheria, or a total mortality from this disease of 3,206, occurred in Canada.

Complete isolation of every case of diphtheria should be maintained until two consecutive cultures from the throat and nose have not shown the presence of diphtheria bacilli. The isolation of the patient should be continued for at least six weeks from the day the disease began. Children or teachers in the same house or apartment must not attend school till they have received a certificate from the M. H. O., which will not be issued before the termination of the case by recovery, death or removal to an isolation hospital. Obviously, therefore, the removal of the patient to an isolation hospital eliminates a possible source of infection to the other inmates of an infected house or apartment, and relieves them from a good deal of disquieting observation.

While these severe rules are generally maintained by careful health officers, they have been considerably modified in some quarters, since the introduction of antitoxin into the curative and immunizing treatment of diphtheria, and here I refer more particularly to the use of antitoxin as an immunizing agent. I shall not refer to its use as a curative agent in diphtheria, except to say that the universal experience of the advanced physicians of the world is that antitoxin should be used as soon as there is clinical evidence of diphtheria.

In reference to the influence and restrictive power of immunizing doses of antitoxin, the best evidence I have read recently is published in *The Ohio Sanitary Bulletin*, January-March, 1907, in which there is a report of the proceedings of the First Annual



PARLIAMENT BUILDINGS, OTTAWA.

Conference of the State Board of Health of Ohio, with representatives of municipal Boards of Health of cities and towns having over 3,000 inhabitants, held at Columbus, Ohio, Jan. 24, 1907. Dr. Samuel E. Allen, M.H.O., Cincinnati, said on this subject: "I am very firmly impressed that the best way to get along with diphtheria is to use plenty of antitoxin. I think it is better than isolation, better than hospitals, and better than anything else, and I am very strongly in favor of immunizing." He also said: "Our quarantine regulations are very imperfect. I often feel, after all our trouble and all our care in quarantine and in keeping children out of school and watching things, that we do very little good, anyhow, because, when we get an epidemic of diphtheria it sweeps over a town and, of course, when there is no epidemic, we think we are doing a great deal; but the epidemic comes in spite of all our watchfulness and care, and we get a large number of cases. So far as having an epidemic of diphtheria is concerned, I believe that the immunizing way of getting at it would be far superior to any method we can pursue as to quarantine regulations."

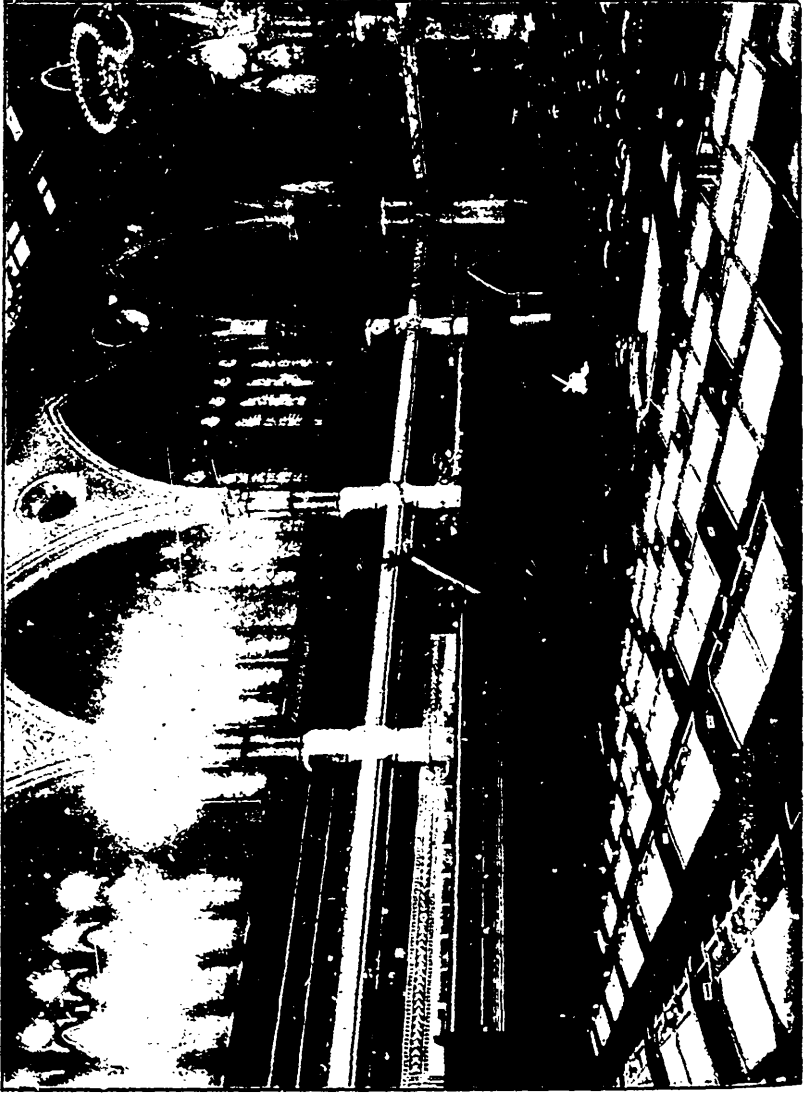
Dr. Blair, M.H.O., Mount Vernon, Ohio, said that "he had used antitoxin for immunizing purposes in fifty cases and none of them contracted the disease." He added: "I think it is just as important to use antitoxin for immunizing purposes as it is to vaccinate for smallpox."

Dr. Chapman, Toledo, Ohio, said: "I believe they will immunize against diphtheria more readily than they will allow you to vaccinate. This seems strange, but they are afraid of diphtheria." And again: "We do not know the cases that would have diphtheria, if they were not immunized, and it would be better to err in being too cautious; there is no harm comes of it; the only objection is as to expense."

Dr. J. G. Reinhart, Toledo, said: "I believe that protection could be secured from diphtheria more readily by using an immunizing agent than by quarantine and separation. . . . I pay very little attention to trying to regulate the household after using antitoxin as an immunizing agent."

Dr. E. J. Schwartz, Salem, Ohio, said: "It is not necessary to give immunizing doses to all the families whenever there is a quarantine case. There are some places where we can separate the family from the patient; but where we find squalor and filth and families closely confined, it is necessary to immunize, and it has been our experience that it has been cheaper."

Dr. David Sisson, Middleport, Ohio, said: "I am certainly in favor of the immunizing doses of one thousand units. I believe that it is sufficient in all cases as an immunizing dose. I believe five hundred units is recommended, but I would not like to trust to five hundred units where there was an epidemic. Where I used it in my own town I did not have to repeat the dose, either curative or immunizing; none took it that had the immunizing dose and none did that had the curative dose, and we



ENTRANCE HALL OF COMMONS PARLIAMENT BUILDINGS, OTTAWA, CANADA.

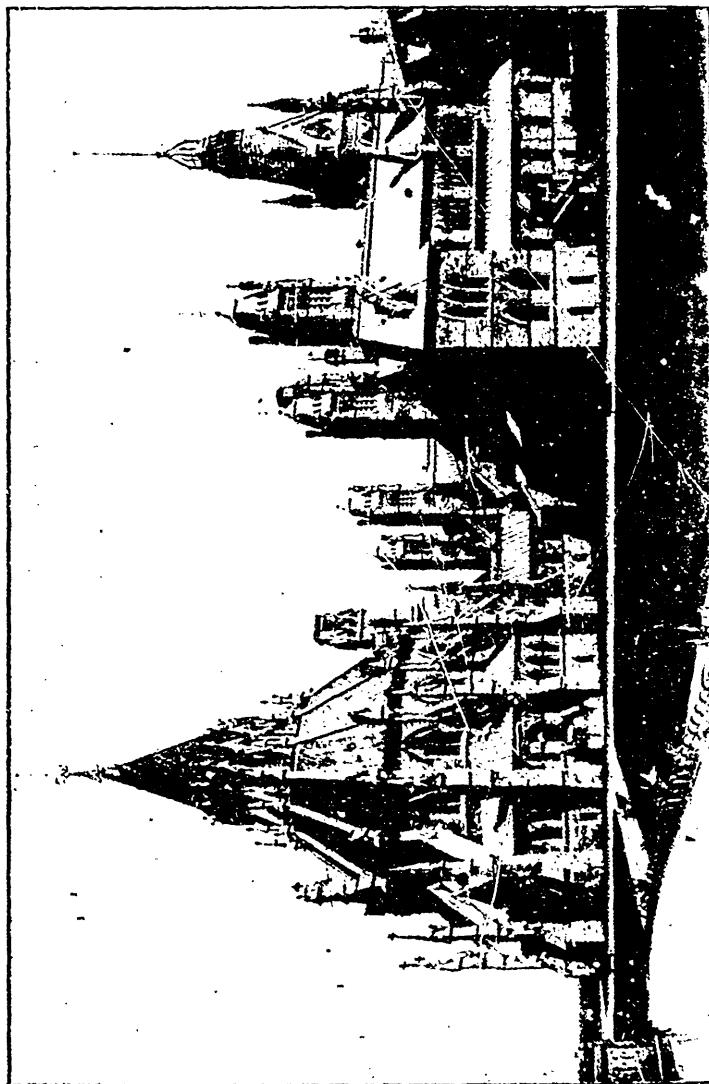
certainly were very successful, either on account of the antitoxin or the mildness of the epidemic."

I have quoted the very words of the Medical Health Officers of Ohio, in order to show the great confidence they feel in the use of immunizing doses of antitoxin, as repressive of diphtheria, and the fact that they prefer the new agent, both for effectiveness and cheapness, to the old-fashioned system of quarantine. The plan adopted by the State Board of Health of Ohio for distributing antitoxin to local Boards is worthy of notice. A large ice chest in the office of the State Board of Health, at Columbus, is kept filled with antitoxin in 1,000 units for immunizing purposes, and three, four and five thousand units for curative purposes. The State Board of Health sends, on the demand of a local Board of Health, antitoxin, with a statement of the amount ordered, and also a statement to the producer who supplies the antitoxin, and he collects the amount from the local Board of Health. Dr. Probst, Secretary of the Ohio State Board of Health, said: "In four months, 1,379 packages, representing 2,640,000 units, were distributed. There were 126 used for immunizing purposes, and in the 126 there were no cases developed."

Dr. Parks who has charge of the antitoxin laboratories at New York, reports that antitoxin was used for immunizing purposes in New York in 1,043 cases, and only three cases developed diphtheria of that number, with no deaths. The Chicago Health Department, reporting upon 1,061 immunizing doses that had been issued by them, stated that of that number only forty-six had contracted diphtheria, and not one of these cases died."

Dr. Probst, Secretary of the State Board of Health, Ohio, said: "We believe that the use of antitoxin in immunizing doses is a very important way, indeed, to control diphtheria. It is more important, in a way, than quarantine, and we think that in every case where diphtheria appears in a family of children and it is impossible to enforce successful quarantine, the best way is to immediately give immunizing doses of antitoxin to all the members of the family."

Measles is a highly contagious disease, the poison of which may be transmitted through clothing and other fomites. The contagium is apparently associated with the nasal and bronchial secretions of the patient, but it has not been isolated. The infection can be communicated to a non-immune person by an individual sickening with it before the rash has appeared. It is an epidemic disease, but, now and then, sporadic cases occur. One attack is fairly protective, but does not give absolute immunity. As there is no immunizing serum for measles, the preventive treatment consists in isolation and disinfection. Owing to the difficulty experienced in diagnosing measles before the appearance of the rash, unprotected persons may be attacked after exposure to the disease in persons not known to have it. According to the decennial census of 1901, the mortality from measles

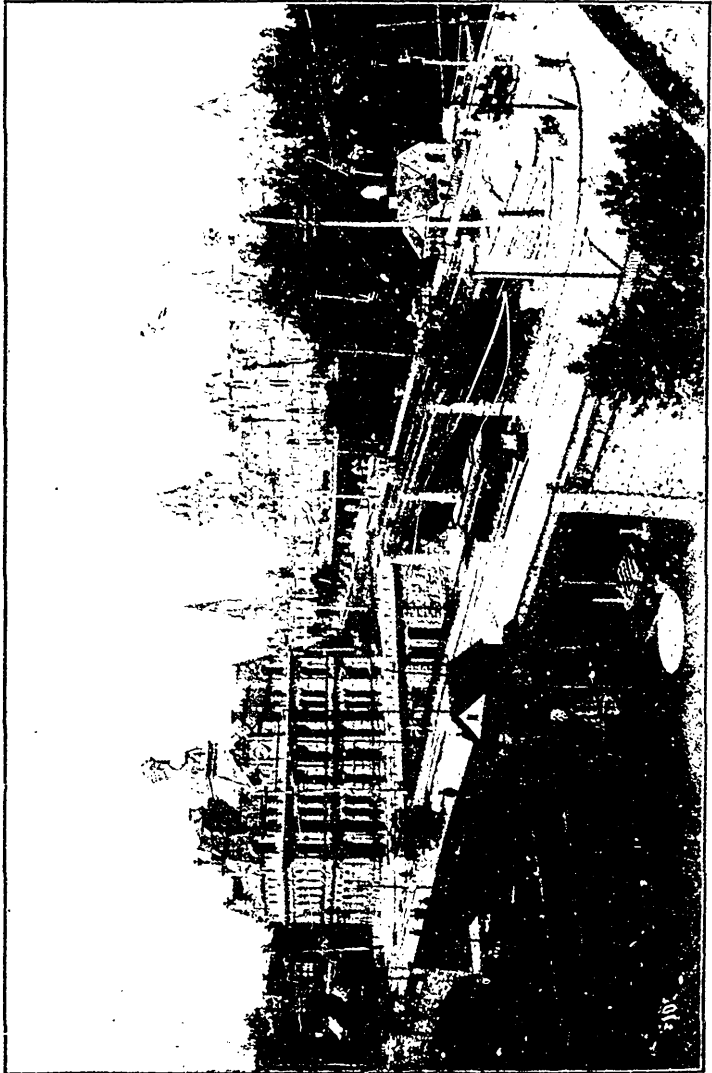


LIBRARY, PARLIAMENT BUILDINGS, OTTAWA.

in Canada was 1,029. The question of isolation will depend a good deal on the severity of the epidemic. Usually isolation is not practised, both children and adults being exposed to the disease in infected centres. Such a lack of isolation is, however, not in keeping with modern ideas, and a suitable pavilion for measles should form part of an up-to-date isolation hospital. I think that the majority of patients suffering from scarlet fever; diphtheria and measles would receive more careful treatment in a municipal isolation hospital, or a private isolation hospital, than at home. Moreover, the regular use of such hospitals would reduce the number of contagious foci in a municipality and would hereby shorten the duration of an epidemic of any one of the diseases mentioned.

The number of isolation hospitals in Ontario is small. At Toronto there is an excellent isolation hospital, in which there is accommodation for eighty scarlet fever cases and eighty diphtheria cases. No accommodation for measles. At Ottawa there is an isolation hospital in which accommodation is provided for cases of scarlet fever and diphtheria, but there is no accommodation for measles. The General Hospital, Kingston, provides isolation in a wing, which is, however, connected with the main building. I do not know of any other isolation hospital in Ontario for the diseases mentioned above.

In the city of Montreal two modern isolation hospitals have been recently established, the St. Paul's Hospital and the Alexandra Hospital. The St. Paul's Hospital, which is a special department of the Notre Dame Hospital, is in the eastern part of Montreal, and the Alexandra Hospital, which belongs to a private corporation, representing the Montreal General Hospital, the Royal Victoria Hospital, and the Western Hospital, is in the western part of that city. The following description of St. Paul's Hospital is given in the Annual Report of the Board of Health of the Province of Quebec, 1905-1906, p. 41: "St. Paul's Hospital is situated on Maisonneuve, Sherbrooke and Plessis Streets. The latter street separates it from the site on which the new Notre Dame Hospital is to be erected. The hospital consists of a building for the administration, of three pavilions, and of the ambulance shed. The hospital has accommodation for one hundred patients; a first pavilion for measles cases, a second for diphtheria, a third for scarlet fever cases. There is no communication between the three pavilions, each of which has its own staff, its own separate furniture, its own linen, etc. When the staff of one pavilion is on duty, it has no relations with that of the others, nor with the outside. Isolation for each disease is complete and distinct. On the first story of each pavilion there is only one door for egress and ingress. That door opens into a sort of vestibule, completely isolated from the remainder of the pavilion, and the cloak rooms and disinfecting rooms open into the vestibule. There the physician puts on and removes the rubber cloth coat he wears during his visit. There the nurses going off



POST OFFICE AND SAPPERS' BRIDGE, OTTAWA.

duty temporarily wash and disinfect themselves, leaving the outer garment they wear while with the sick, and put on other garments when necessary. Previous to their destruction, the sweepings, rubbish and soiled dressings are left at the door. A man appointed for the purpose removes the refuse and rubbish and burns them in a special room in the ambulance shed.

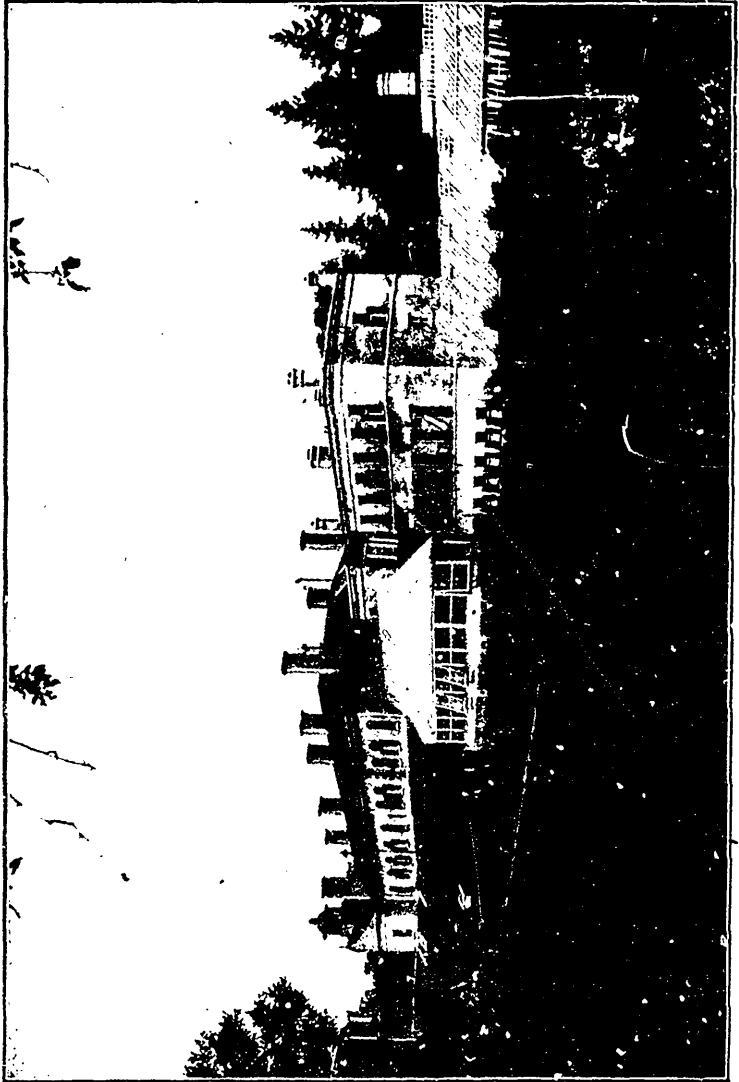
The St. Paul's Hospital possesses a special feature. The three pavilions communicate by passages in the basement with the administration building and with the general hospital. The building for the latter forms part of the plan, drawn up for the new Notre Dame Hospital, which will shortly be erected. Of course, the basement passages are like a vestibule entrance, isolated from the pavilions themselves. Those who go through these passages, either for the purpose of bringing provisions or of bringing back the washed articles or linen, have no communication with the upper stories. The plates, dishes, cups, etc., are disinfected in the pavilions themselves; the soiled linen falls through shafts into special rooms in the basement, where it is disinfected before being sent to the laundry. In the basement also are the heating pipes, the light and telephone wires, and the electric ventilating fans.

Everything in connection with the laying out of the pavilions is arranged with a view to cleaning and disinfection. The corners of the walls, the angles of the ceilings, are rounded; the sills of the window frames are on a steep slope; the floors are of hardwood; the surfaces (walls and ceilings) may either be washed or whitewashed. As far as possible, nothing but metal, glass or porcelain enters into the construction of the furniture. There is no furniture beyond what is strictly necessary in the rooms and wards. Finally the system of heating that has been adopted requires no coils.

To avoid even a remote danger of contamination, the hospital sewage runs into a large disinfecting cesspool, where it is deprived of its virulence, before flowing into the city sewers.

The heating and ventilation are effected by a combined system. Heated air, introduced by ventilation, serves at the same time to maintain the temperature of the apartments at the required degree. The air in the rooms is renewed 8 or 10 times an hour. The air from outside is screened, purified by passing through water, heated in winter to the proper temperature, and is then driven by electric fans through special shafts to the rooms and wards, where it displaces the vitiated air. The pure air shafts and the vitiated air shafts are sunk in the walls and are controlled by easily reached regulators.

Some rooms have automatic regulators which allow of the temperature being maintained at the required degree, while another appliance gives the necessary degree of humidity to the atmosphere, an important point in hospitals where eruptive fevers are treated, in which the respiratory organs may be affected. The system of ventilation is that known as the plenum system.



GOVERNOR-GENERAL'S RESIDENCE, RIDEAU HALL, OTTAWA.

The Alexandra Hospital, Montreal, is, if anything, more elaborate in structure and appointments than the St. Paul's Hospital. In addition to the administration building there is a scarlet fever pavilion, the largest of the group, 92 x 112 feet in size, for which an entrance by the corridors and an entrance porch from the grounds are provided. Before entering the pavilion proper an examination room and a discharge room are noted, so that a patient on entering is examined by the physician in charge, and if the disease he is suffering from has been diagnosed properly the patient is passed on to the ward or private room to which he is assigned.

Both the diphtheria and measles pavilions are similar to the scarlet fever one in accommodation, but slightly smaller, being 124 x 40 feet in size. As these diseases do not require the same length of time for isolation smaller buildings will answer.

The erysipelas pavilion is as yet held in abeyance, but will consist of a one-storied structure 30 x 62 feet in size.

The observation building is also held in abeyance for the present, but will be similar in layout to the erysipelas pavilion and will be used for the treatment of mixed, doubtful or undetermined cases. In the meantime, a temporary observation pavilion has been provided to the west of the scarlet fever building.

As to the construction of the buildings, terra cotta, steel, concrete, brick and stone are the only structural materials that have entered into them, and every provision is made to prevent lodgment of infectious material. With this in view wooden flooring has been eliminated and a cement floor covering has been used that is free from cracks or seams; this is rounded next the walls and turns up on the same to form the baseboard. All walls and ceilings are in hard plaster, painted and enamelled white, the only hardwood used being the sashes and doors, and these latter are of veneered hardwood without panels or mouldings.

In the ventilation and heating of the Alexandra Isolation Hospital, a supply of fresh, screened air, heated in winter, is provided at each bed, while there is also at each bed an open aspirating duct ensuring an updraught in both winter and summer, as these will be in operation even when the heat is turned off from each room. Boyle's ventilators cap each duct.

My conclusions are:

(1) A public isolation hospital, however small, should be established in every urban municipality in Ontario. Private isolation hospitals for the rich should be encouraged.

(2) Separate pavilions should be provided in isolation hospitals for cases of scarlet fever, diphtheria and measles.

(3) There should be an observation room in each pavilion for doubtful or undetermined cases.

(4) In designing isolation hospitals, architects should provide simple structures, abundantly supplied with light and air, suitable for the isolation of the infected sick, while in every hygienic way assisting in promoting their recovery.



LOWERS' WELL, OTTAWA.

DISCUSSION.

Dr. J. N. E. Brown, in discussing Dr. Cassidy's paper, held that diphtheria, scarlet fever, measles and whooping cough should be treated preferably each in an isolated pavilion of its own. Another pavilion might be built for erysipelas, mumps and chicken-pox—each having an isolated flat.

The two requisites in the handling of these diseases were isolation and disinfection. These could not be secured in the crowded homes of the poor, nor, conveniently, in the houses of the average well-to-do citizen. Such cases could not be treated in boarding houses, boarding schools, orphan homes, and the like, unless separate isolation buildings are provided and equipped as hospitals.

The new Jefferson Medical College Hospital, Philadelphia, shows how provision could be made in a large block hospital for any suspected case of contagious disease which may be brought to it or for any case developing in the hospital.

Each of the top storeys, got at from outside elevators which would go clean up above the roof, would have a complete suite of wards, rooms and kitchens and might be to all intents and purposes a separate little isolation hospital in itself.

In smaller towns one building with five separate and isolated flats of wards and rooms, each flat having its own exits to out-of-doors, each with a separate menage, could be made to accommodate these contagious cases.

But, of course, the ideal plan would be to have the separate pavilions.

The wards for these cases should be small, none holding more than four patients, and a number of them with single beds only. This would permit of the segregation of the early cases from advanced, the simple from the complicated and the noisy from the quiet.

With vaccination, isolation and disinfection, smallpox, from being a most common disease, has almost disappeared. Diphtheria with immunization and treatment by antitoxin, isolation and disinfection is losing its terrors. With the discovery of the microbe of measles, isolation, and disinfection, measles will become as rare as smallpox. And so with these other diseases. But until the causative germ is found let us have the isolation and disinfection.

After some further discussion,

Dr. Bruce Smith moved, seconded by Dr. ———, that in the opinion of the meeting, municipal authorities should erect and maintain their own isolation hospitals, instead of utilizing existing general hospitals for the treatment of cases of scarlet fever, diphtheria and measles. Carried.



ELCOM PARLIAMENT HILL, LOOKING WEST, OTTAWA.

THE X-RAYS IN DISEASES OF THE SKIN.

BY D. KING SMITH, M.E., TORONTO.

THE wonderful advances made in radiography during the past few years are fully appreciated by the medical profession, so that now radiography is recognized as a great aid in certain branches of surgery.

On the other hand, radiotherapy seems to occupy a very doubtful position, owing to the fact that on its introduction many believed that it was a cure for all diseases.

The many claims of the wonderful action of the X-rays in diseases of the skin have not stood the test of time, nevertheless we must to-day acknowledge that the X-rays is a very powerful therapeutic agent in dermatology.

Until the physician and the radjotherapist work hand in hand it will be impossible to arrive at the exact status of the X-rays in diseases of the skin. The majority of dermatologists are not experienced in the technique of the working of the machine, hence no doubt unfavorable results have been obtained, while the radiotherapist, on the other hand, may possibly not recognize the true character of the lesion.

The object of this paper is to give briefly the commonest diseases of the skin in which the X-rays has proved beneficial.

For convenience of description I will discuss its action under different classes, such as

THE X-RAYS AS AN EPILATING AGENT.

In diseases where depilation is indicated the X-rays is very useful, such as in ring-worm of the scalp, favus, some forms of folliculitis, sycosis barbae and coccogenic; in many of these conditions it would not be well to use the rays in every case, but in rebellious ones the use of the rays would be of much service.

In hypertrichosis, at first, the rays was thought to be the ideal treatment; for depilation can be obtained in the majority of cases readily; in a month or two, however, regrowth takes place. Some workers claim that on the appearance of the regrowth short exposures will again depilate. At the present day the rays is seldom used in this condition, as the dangers of a dermatitis-atrophy of the skin or permanent telangectases are so great that the condition would not warrant the use of the rays.

RESOLVENT ACTION OF THE X-RAYS ON NEW GROWTHS.

Keloid.—Many successes in the treatment of this condition have been reported. As a rule, radiotherapy should be reserved for



ROCKCLIFF PARK, NEAR OTTAWA.

the treatment of large keloids, which are occasionally met with. The exposures necessary are many, and the treatment is prolonged, so that in small keloids some other form of treatment is indicated.

Mycosis Fungoides.—Crocker, Hyde and others have spoken highly of the rays in this disease. Before the introduction of the X-rays no treatment had any effect. During the past few years some brilliant results have been obtained. The first thing noticed is the lessening of the pruritis, which completely disappears in many cases, then the tumors and infiltration gradually disappear.

The rays is worthy a trial in all cases of this serious disease.

EPITHELIOMA AND RODENT ULCER.

I cannot do better than quote A. R. Robinson, of New York, on the treatment of cutaneous cancer by the X-rays:

“It is a great error to maintain that with the X-rays alone all cases of cancer of the skin can be cured. This is not even true of cancer seen in a very early stage. It is also an error to hold that in all such cases where it could effect a cure it is the best agent to be employed. I believe its exclusive use should be limited to a very few cases out of all those that come under observation, such as those of rodent ulcer and some cases of superficial prickled-celled epithelioma.

In the majority of cases of superficial epitheliomata a combination of treatments, as by caustics and by the X-rays give the best results.

Hard, firm, elevated, epithelial margins must be made more vulnerable by injuring agents, such as caustics, before the X-rays are applied. In the deep nodular forms, especially of the lip, I do not think the X-rays should be relied upon, for whilst it may have benefited, or even cured some cases, it has in others hastened the growth of the cancer, and much time, valuable to the patient, has thus been lost.

Unless a very satisfactory action is shown after a few treatments, the use of the X-rays should be discontinued and other methods should be employed.

The application of the X-rays—twenty, forty, eighty or even more times—for the removal of a cancer that could have been removed equally well in a few minutes or a few hours, according to the condition of the case and the method employed, is a wrong to the patient.

“The X-rays is a valuable agent for nearly all superficial epitheliomata when used along with other treatment.”

In cancers that have invaded the skin, and ulceration has taken place, the X-rays often relieves the pain, and, therefore, might be employed with benefit. In such cases as cancer of breast after



RIDEAU FALLS, OTTAWA.

removal and recurrence follows, good results have sometimes followed the action of the rays.

Sarcoma.—Observers are far from being agreed as to the success of the treatment by the rays; the same amount of success has not been met with as in epithelioma.

Verrucae and Cutaneous Horns.—There is no doubt that radiotherapy has a destructive action on certain forms of warts; as other methods are successful the X-rays has not been used extensively.

PRURIGINOUS DERMATOSES.

The diseases under this heading are all characterized by the common symptom of pruritus. In many of these diseases the pruritus seems to be the chief symptom. It may be the only symptom, or be accompanied by a local lesion of the skin. The X-rays may act simply on the pruritis, or it may influence the lesions of the skin also.

One of the most marked and indisputable effects of radiotherapy is the rapid diminution and cessation of the pruritus. In some cases the improvement is only temporary.

Anal and vulvar pruritus have been rapidly relieved in many cases by the X-rays. Only in very severe and obstinate cases, after other methods have failed, should we have recourse to radiotherapy.

VARIOUS DISEASES.

Lupus Vulgaris.—In many cases of lupus vulgaris the X-rays is very beneficial. It is seldom used alone, but along with the Finsen Light.

Cases treated by the Finsen Light, when progress does not seem satisfactory, a change to the rays and then a return to the light have shown marked improvement.

Lupus Erythematosus.—Radiotherapy has not given very encouraging results in the treatment of this disease, and the cures which have been reported are by no means conclusive; far better results have been obtained by the use of the high frequency currents.

To ascertain the opinion of dermatologists regarding the use of the X-rays in acne vulgaris, acne rosacea, psoriasis and eczema, Dr. Andrew Biddle, of Detroit, drafted a communication with the following questions:

1. (a) Has the use of Roentgen rays been found beneficial in the treatment of acne, acne rosacea, eczema and psoriasis?
- (b) If so, in what stage or type of the respective disease have the exposures to the rays been found useful.
- (c) When contraindicated or harmful and when of doubtful value?



CHAUDIERE FALLS, OTTAWA.

2. (a) Are the exposures preferred as the routine treatment or are they applied to the rebellious cases only?
- (b) Is the duration of treatment shortened?
- (c) Are more permanent results secured?
3. Has the use of the X-rays been as helpful as anticipated, or have they proven more or less disappointing in the treatment of these diseases?

He received replies from many distinguished men in England, Germany, France and United States. Naturally there is a great difference of opinion, yet in some respects the majority seem to agree on certain points. Some are most enthusiastic, while others would dispense with the use of the rays entirely in these diseases. Leslie Roberts (Liverpool) says "that the treatment of acne, rosacea, eczema and psoriasis by X-rays is irrational, improper and utterly inadmissible on scientific grounds," and thinks that those who talk of "curing" these diseases by rays do not clearly understand the nature of the diseases.

The Concensus of Opinion in Acne Vulgaris.—The greatest difference of opinion of the value of the rays was in the treatment of this disease. Only a few advise their use as a routine practice. On the other hand, many have reported great benefit when used in conjunction with other treatment.

Most observers would confine their use to chronic, indurated, sluggish cases, while others have discarded their use entirely.

There is no doubt in many cases of acne vulgaris most favorable results are obtained. Experience has shown that radiotherapy is not of the same curative value in all cases, and in some has but little influence unless pushed beyond the safety limit.

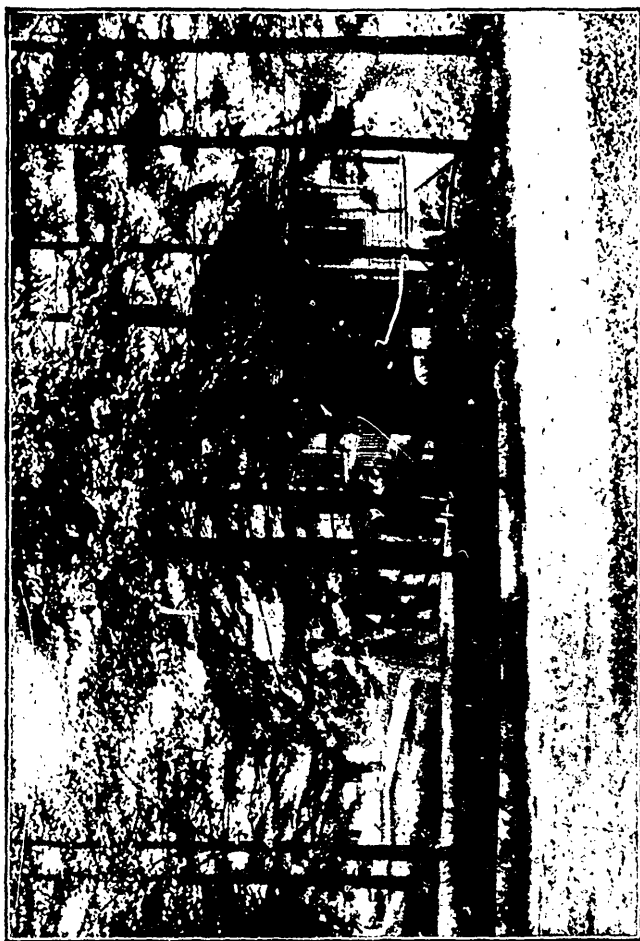
Relapses are also not uncommon, but not so common as with other methods (opsmic treatment not included?).

When the X-rays are employed it is wise to use them conservatively and with other methods of treatment.

Acne Rosacea.—When there is marked sebaceous glandular inflammation the X-rays probably would be of considerable service, as it seems to have a special action on glandular tissue causing atrophy of the glands. The rays have little effect on the dilated vessels and almost none on the tumefaction. The results in this condition have not been very encouraging, although Galloway, the Whites and a few others report favorably of the X-rays.

Psoriasis.—Typical psoriasis does not usually need radiotherapy for its cure. A temporary cure at all events is generally obtainable by external applications aided by internal medication.

Certain obstinate varieties, however, remain for years with slight alterations, in which every kind of treatment has been tried without benefit. In these cases radiotherapy often gives satisfactory results.



ONE OF THE FAMOUS SPRINGS OF THE CALEDONIA SPRINGS HOTEL, C. P. R.

Relapses are just as frequent as by other methods of treatment. The rays deserve a trial in psoriasis of the nails, as good results have been reported by many.

In psoriasis the X-rays should be reserved for the persistent large infiltrated patches, or to the aggregation of smaller lesions which nothing else seems to affect with any degree of permanency.

Eczema.—This being by far the commonest disease of the skin, the X-rays have been tried in many cases. Here as in other diseases the results obtained vary greatly. Some observers report most brilliant results, while others have little to say in favor of the rays.

Many agree that the X-rays are most useful in chronic patches of eczema, especially in the hands and feet. No harmful effects have been observed in the treatment of the chronic condition, but in subacute cases very great care must be used, otherwise much harm may result.

A chronic patch which has resisted ordinary treatment, if given a few exposures, then the original treatment resumed, will sometimes show marked improvement.

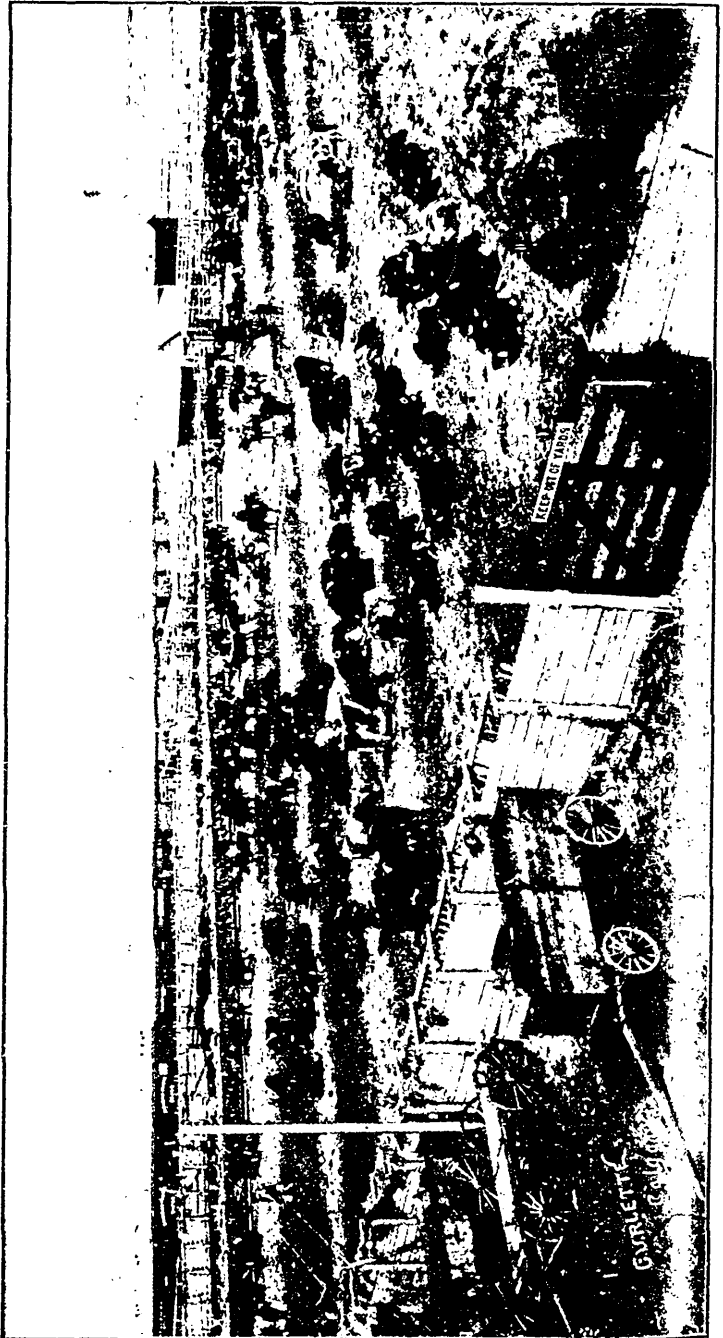
In acute cases when the pruritus is unusually severe and protracted short exposures have been given, the pruritus has been relieved, but the use of the X-rays for such conditions could not be recommended, and its use would only be indicated in very exceptional cases.

Chronic Ulcers.—As the X-rays have a stimulant action on cellular activity it seems indicated in chronic ulcers, especially after all the ordinary treatments have failed. Many observers have reported exceedingly good results.

Nævus.—Radiotherapeutic treatment has been used in the treatment of nevus without much success. Electrolysis in the majority of cases acts with greater certainty.

A few successful results have been reported.

Not until the action of the X-rays is better understood will its standing as a therapeutic agent be possible to estimate. At the present day we are working more or less in the dark, for the exact dosage cannot be regulated, and the fear of a dermatitis, atrophy of the skin, warty growths, permanent telangiectases is continually before us, so that no doubt many a time an under exposure is given where good results might be obtained by a longer one. Again the over-confident worker is liable to risk too much and some bad results follow, so that until exact dosage can be obtained great uncertainty as to the position of the X-rays in dermatology will remain.



STOCK YARDS, CALGARY.

ON THE DIRECT COUNTING OF BACTERIA AND THEIR RECOVERY FROM BLOOD.

BY T. M. WILSON, B.A., M.S., M.D.
Hull Physiological Laboratory of the University of Chicago.

It is often desirable for diagnostic purposes in hospitals and some private laboratories to make bacterial cultures from the blood of patients suspected of certain diseases. For this purpose 5-10 c.c. of blood are taken from a vein, placed in suitable culture media and the culture then examined for bacteria, the whole process taking from 24 to 48 hours. It was suggested by Dr. Capps, of Rush Medical College, that some means might be found for the direct recognition of bacteria in blood. Ordinarily a centrifuged specimen is so dense with corpuscles that to microscopically detect therein a few possible bacteria becomes a hopeless task.

It was thought that by inoculating a definite quantity of blood with a known number of bacteria, the latter might be recovered if a method were employed, somewhat similar to that used in the bacterial examinations of urine. With this end in view I made a series of experiments with streptococcus pyogenes and bacillus typhosus.

A number of clean sterile test tubes were taken, each containing 9 c.c. of sterile filtered distilled water. Into the first test tube was placed 1 c.c. of a 24 hour bouillon culture of streptococcus. This first dilution was thoroughly mixed, and from it 1 c.c. was taken and transferred to a second tube, and the second tube treated in the same way as the first. Thus a third dilution was made from the second and so on. There resulted a series of graduated dilutions, having* 10-1, 10-2, 10-3, 10-4. 10-8 bacteria per unit volume, compared with the original culture. The approximate number present in 5 cu. mm. of the weaker suspension was next investigated. The measurements of such small quantities was done by using the finer graduations of the pipette of an ordinary Thoma-Zeiss Hemocytometer. To facilitate subsequent microscopic examinations a small circle of about 5 mm. diameter was etched on a glass slide. The minute drop taken after carefully shaking the specimen to be examined was then placed and dried, not all at once, but in parts on the slide so as to occupy almost all the space within the etched circle. The diameter of the circular smear was measured by means of the low power of a compound microscope, using as a scale the Thoma-Zeiss rulings. From the value thus obtained the area was calculated. The diameter of the smear in one case was found to be 3 mm., and hence its area was approximately 7 sq. mm. After

*10⁻¹ = $\frac{1}{10}$ 10⁻² = $\frac{1}{100}$ etc.



LAKE LOUISE, FROM CHALET PORCH, NEAR LAGGAN, ALBERTA.

this procedure the specimen was stained for five minutes with one drop of fresh filtered Löffler's methylene blue. By means of an oil immersion lens the bacteria in ten fields within the etched ring were counted. Each field was found to be 7-100 sq. mm., also measured by the Thoma-Zeiss rulings, so that the total area of the smear in this case was 40 times the area actually counted. The number of bacteria present in the smear, or what is the same thing, the number of bacteria in 5 cu. mm. of the blood examined, was therefore 40 times the number counted. In this specimen the average was two groups (each group containing one or more bacteria) per high power field, or 500 per 5 cu. mm.

In making comparisons of this method with the one ordinarily employed the precaution must be taken of counting each group of bacteria in the direct method as one member, since it can form but one colony just as the individual bacterium can do. Satisfactory work in the cultural method requires that not less than one c.c. of bacterial suspension should be added to the melted agar and that the total number of colonies in one plate should not exceed 500.

For these reasons a control was made by plating an agar and counting the colonies, not from the same dilution but from the two next lower series of dilutions. The methods of direct staining were thus found to give approximate results for the number of bacteria per unit volume in the specimen examined. The richer suspensions could, of course, be calculated from the one actually examined.

By means of a sterile hyperdermic needle one c.c. of blood was drawn from the jugular vein of a dog, placed in a sterile centrifuge tube and about 300 streptococci added. The cocci were obtained by taking two cu. mm. of 10-6 suspension, which had been found by previous examination to contain about 150 streptococci per cu. mm. To this was next added 19 c.c. of sterile filtered distilled water and the whole centrifuged at a speed of 70 revolutions per second in a tube of 18 c.m. radius, for about 20 minutes. Then the supernatant fluid was syphoned off by means of a sterile pipette and one c.c. from the bottom of the centrifuge tube was transferred to a narrow tube so that the one c.c. now constituted a column with a length of approximately 10 c.m. This tube was corked as the larger one had been and again centrifuged for five minutes. By means of a finely drawn out pipette a few cu. m.m. from the bottom of the tube containing the ghosts of the red corpuscles, and the bacteria, were placed on a clean slide and the dried smear stained with methylene blue for 45 minutes, then washed and mounted. Its examination showed the presence of several streptococci.

Another experiment with staphylococcus gave similar results. Having thus shown that the detection of the bacteria was possible, another experiment was made to determine in an approximately quantitative manner what proportion of the bacteria

this procedure the specimen was stained for five minutes with one drop of fresh filtered Loeffler's methylene blue. By means of an oil immersion lens the bacteria in ten fields within the etched ring were counted. Each field was found to be 7-400 sq. mm., also measured by the Thoma-Zeiss rulings, so that the total area of the smear in this case was 40 times the area actually counted. The number of bacteria present in the smear, or what is the same thing, the number of bacteria in 5 cu. mm. of the blood examined, was therefore 40 times the number counted. In this specimen the average was two groups (each group containing one or more bacteria) per high power field, or 800 per 5 cu. mm.

In making comparisons of this method with the one ordinarily employed the precaution must be taken of counting each group of bacteria in the direct method as one member, since it can form but one colony just as the individual bacterium can do. Satisfactory work in the cultural method requires that not less than one c.c. of bacterial suspension should be added to the melted agar and that the total number of colonies in one plate should not exceed 500.

For these reasons a control was made by plating an agar and counting the colonies, not from the same dilution but from the two next lower series of dilutions. The methods of direct staining were thus found to give approximate results for the number of bacteria per unit volume in the specimen examined. The richer suspensions could, of course, be calculated from the one actually examined.

By means of a sterile hyperdermic needle one c.c. of blood was drawn from the jugular vein of a dog, placed in a sterile centrifuge tube and about 300 streptococci added. The cocci were obtained by taking two cu. mm. of 10-6 suspension, which had been found by previous examination to contain about 150 streptococci per cu. mm. To this was next added 19 c.c. of sterile filtered distilled water and the whole centrifuged at a speed of 70 revolutions per second in a tube of 18 c.m. radius, for about 20 minutes. Then the supernatant fluid was syphoned off by means of a sterile pipette and one c.c. from the bottom of the centrifuge tube was transferred to a narrow tube so that the one c.c. now constituted a column with a length of approximately 10 c.m. This tube was corked as the larger one had been and again centrifuged for five minutes. By means of a finely drawn out pipette a few cu. m.m. from the bottom of the tube containing the ghosts of the red corpuscles, and the bacteria, were placed on a clean slide and the dried smear stained with methylene blue for five minutes, then washed and mounted. Its examination showed the presence of several streptococci.

Another experiment with staphylococcus gave similar results. Having thus shown that the detection of the bacteria was possible, another experiment was made to determine in an approximately quantitative manner what proportion of the bacteria

added could be recovered. About 300 typhoid bacilli were put in one c.c. of blood and about 100 or 33 per cent. were recovered from a few cu. mm. of the second sediment.

These experiments tend to show that even when comparatively few bacteria are present per cu. mm. they can always be detected by the above means.

At first thought it would appear that the cultural method would be a far surer means of detecting the bacteria when a limited number were present, since in their successful detection only one bacterium capable of reproduction in the cultural media is necessary for their recognition by such means. On the other hand dead bacteria and those rendered inactive by the anti-bacterial agencies of the plasma and phagocytes of the blood fail to grow. As a result of these immunizing forces hundreds of bacteria per c.c. might be present and yet cultures thereof might be sterile. To throw light on this point the following experiment was made.

Two c.c. of fresh sterile defibrinated blood were taken from the femoral vein of a dog and inoculated with 2 c.c. of 10-3 dilution of an 18 hour culture of streptococci found by the direct method to contain 840,000 groups and by the cultural method about 191,000 bacteria. The 4 c.c. were incubated at 37 deg. C. for 35 minutes, thereby allowing sufficient time for the polymorphous neutrophiles and the plasma to take up the bacteria, and yet not sufficient time for great multiplication to occur. After this interval one c.c. of this blood was plated in melted agar and incubated at 37 deg. C. for 36 hours. Dilutions of 10-1, 10-2, 10-5, were also made of the same mixture and likewise plated and grown for 36 hours. At the expiration of this period the colonies were counted.

The primary mixture had not more than 4,000 colonies.

One c.c. of 10-1 dilution gave 291 colonies, or equivalent to 2,910 colonies if the specimen had been undiluted.

One c.c. of 10-2 gave 29, likewise equivalent to 2,900 of the original mixture.

One c.c. of 10-3 dilution gave 4, or 4,000 if undiluted.

The average of the four plates was about 3,000 per c.c.

Thus of the 191,000 per c.c. originally present, only 3,000 remained after 35 minutes' treatment with dog's blood, and if we take cognizance of the individual bacteria, and not of the groups, the number originally present in the 10-3 suspension would show a still greater difference when compared with those recovered. Thus it is seen that the action of the phagocytes may very seriously reduce the number of colonies obtainable by the ordinary method.

While I have made no clinical observations of the suggested method, its applicability to clinical purposes is evident. One can aseptically take one c.c. of blood from the patient, transfer



it to a corked tube containing clean, sterile, distilled water and centrifuge it. After 20 minutes it is placed in a narrow tube and again centrifuged. Finally a stained smear may be made from the lowest contents of the fine tube. Where the bacteria are very abundant the second centrifugalization may be unnecessary.

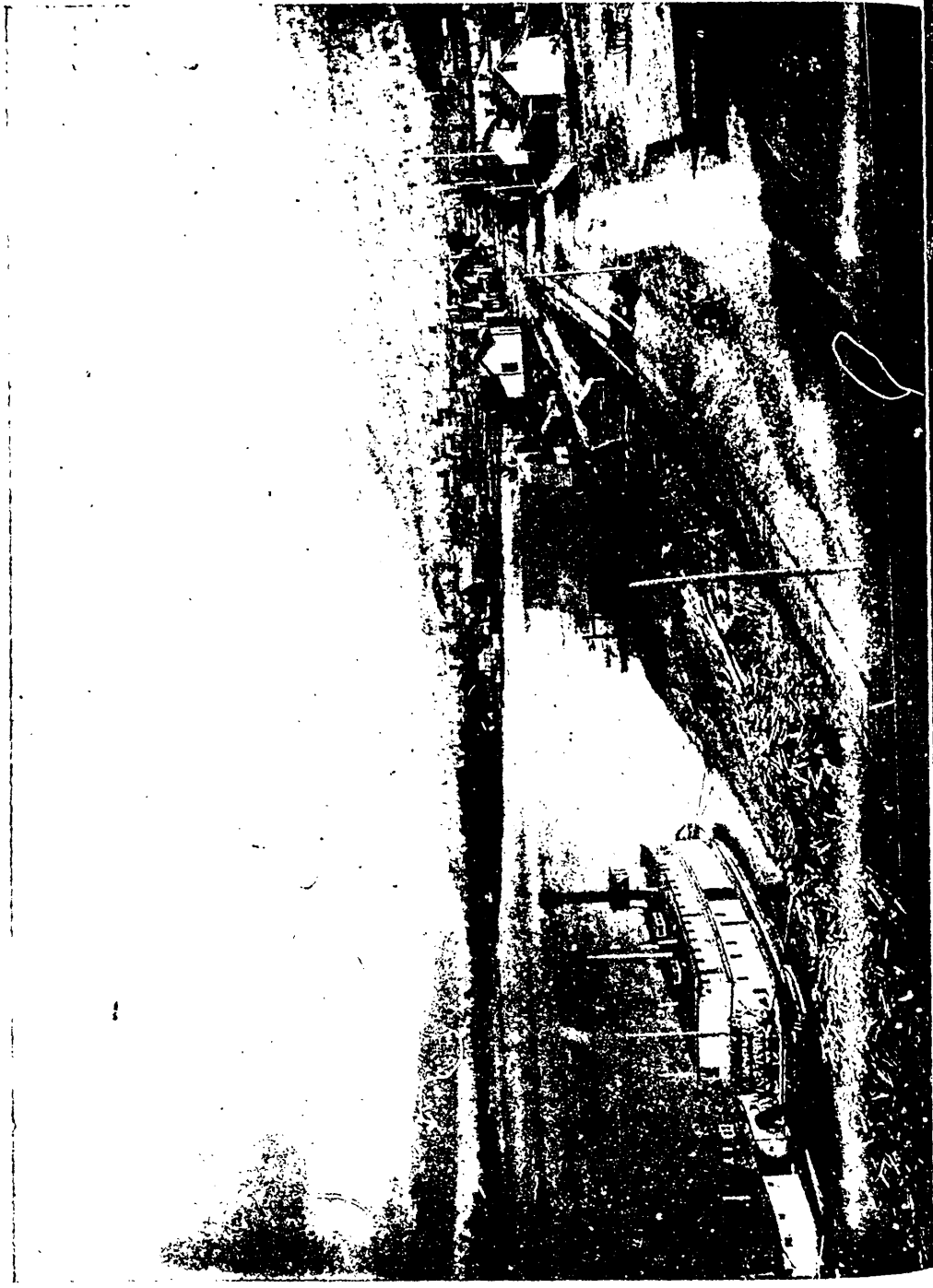
SUMMARY.

1. The direct method of counting bacteria gives very satisfactory results and is as easily performed as an ordinary red blood count.

2. The recognition of bacteria by the cultural method gives no idea of their actual concentration.

3. The direct method of obtaining bacteria from blood is simple, accurate, and requires a comparatively short time for its accomplishment.

I beg to thank Prof. G. W. Stewart for his kindness in revising this paper and Prof. S. A. Mathew for laboratory accommodation in his department.



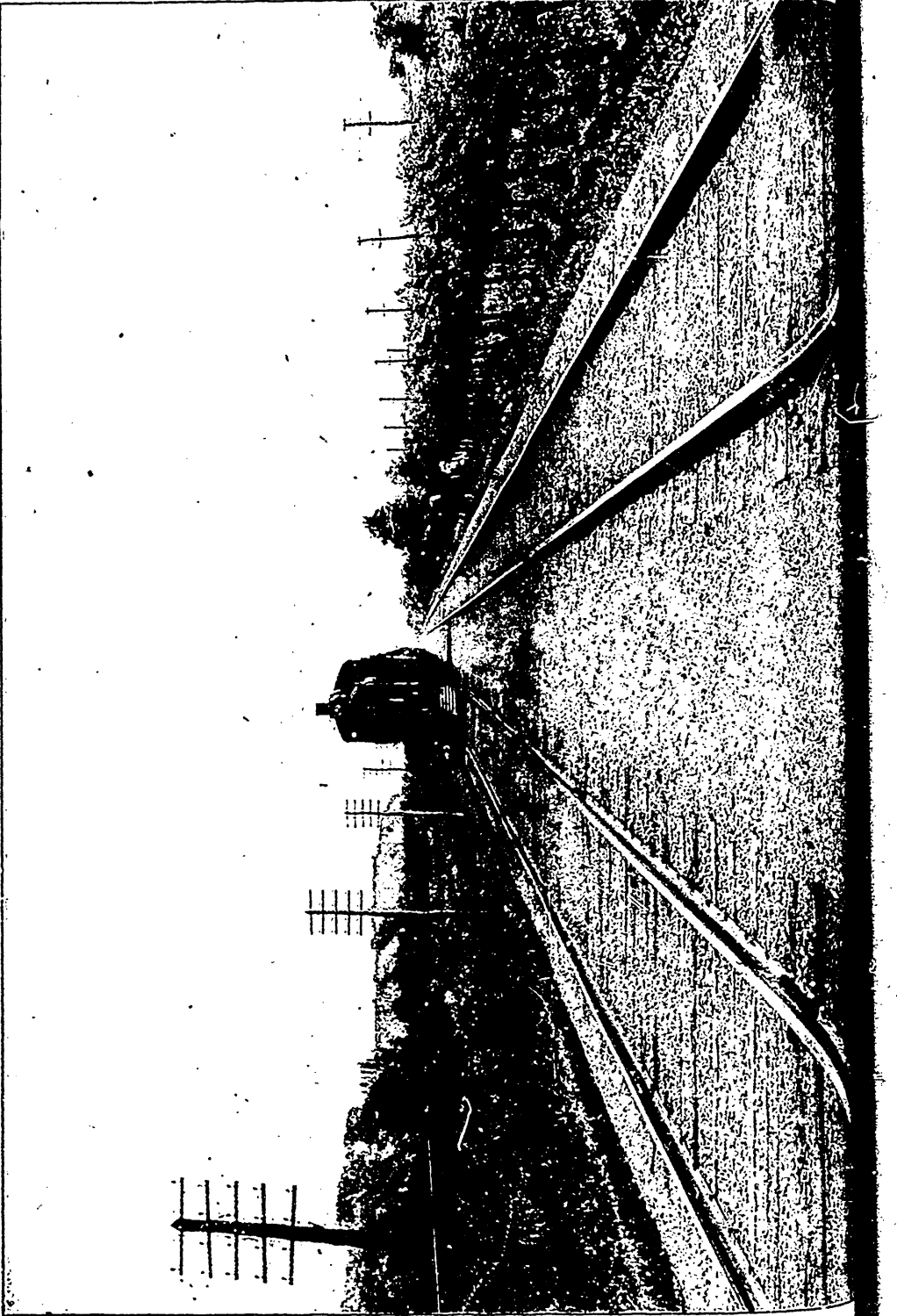
ANESTHESIA BY HYOSCINE AND MORPHINE WITH CACTIN.

BY W. C. ABBOTT, M.D., CHICAGO, ILL.

QUESTIONS concerning the effects of new remedies should not be settled by a few chance experiments, but by the reports from many observers, embracing the data from many cases. By this means we may eliminate chance and prejudice, learn to recognize in the varying results achieved the effects of different technic, and define the true field of the remedy by its proper bounds. Unless this is done we are apt to fall into error. For instance, what would become of ether as an anesthetic if, after S. Weir Mitchell had employed it in three experimental cases, all fatal, the profession had accepted his unqualified condemnation and dropped its further consideration? How funny the grave and rather sanctimonious disapproval of anesthesia, published by the great medical authorities at its first introduction, appears to us now. When we reflect that every prominent advance in medicine has met the same opposition it should make us chary of hasty condemnation.

In Wood, Jr.'s, statistical table (*American Medicine*) he enumerates one surgeon who employed scopolamine and morphine in just one case; the patient died and the death was attributed to the anesthetic, though on what grounds is not stated; the surgeon refrained from any further trials of the method, but reports his mortality at 100 per cent. Of what possible value is such a report? Compare it with that of Gauss (see *Clinical Medicine*, June, '07), who administered this combination in 1,000 cases of childbirth, losing no women from the anesthetic and reducing the mortality of the babes from 49 to 29 per 1,000. While the anesthetic did not cause the death of a child, it actually saved the lives of nearly one-half those who would have died without it! These brilliant results were attained by taking scrupulous care as to the purity of the drugs employed, and elaborate perfection of the technic of their administration.

One element in accounting for the remarkable safety of this combination is the rapidity with which it is eliminated. A recent observer, Holzbach, has announced that scopolamine can be detected in the urine first passed by the infant after its birth (when the drug has been administered to the mother during the labor), and sometimes in the second; but never more than a trace, if that, in the urine of the third discharge. We may therefore dismiss from consideration, as caused by scopolamine (hyoscine), any phenomena occurring after this third discharge of the child's urine. As to the effects of the morphine, these are too well-defined and unvarying to be mistaken. If an infant dies with a respiration-



rate of sixty per minute, whatever may have been the cause of death it was not morphine.

The medical profession of America has now been supplied with a million of these anesthetic tablets of hyoscin, morphine and cactin (H.M.C., Abbott's). According to the deduction made by young Wood, there should have resulted one death from each 221 anesthesias, or 4,520 deaths. Surely such a holocaust of slaughter could not have escaped everybody's notice! But we will allow for several tablets having been used for each anesthesia, and for many being yet unused in the hands of the purchasers, and divide by ten—and we should still have 452 deaths. To be very fair, divide by 100, and we look for 45 deaths. Instead of that we have been unable to find a solitary death reported that is fairly attributable to the anesthetic. Several deaths have been reported, but investigation has failed to show any reasonable evidence that they were caused by the drugs named. Deaths will and must occur after various surgical operations, but there are other causes than the anesthetics.

On the other hand, evidence accumulates to show that these other causes of fatality are to a great extent combated by this anesthetic combination, and that the results with it are better than with ether or chloroform. After the first injection of the H.M.C. all fear of operation vanishes, and the patient's mind is tranquil and confident. Shock is practically eliminated, the peril of hemorrhage lessened, nausea and vomiting almost always prevented, and post-operative pain prevented. The writer has had a notable instance of this last point in his own practice: A patient was subjected to a vaginal hysterectomy somewhat more than a year ago. Total abstinence from even water was enforced for some time after the operation, and meanwhile the attendants kept the telephone wires hot with questions as to whether the intense suffering was right, etc. The operation was very successful in all respects. Quite recently another patient was subjected to the same operation under almost identical conditions, save that in this case the H.M.C. anesthesia was employed instead of ether. The operation was followed by a prolonged and refreshing sleep, from which the patient awoke free from all nausea and pain; she was allowed water when she desired it, took a cup of coffee next morning and watermelon on the next, and her one complaint has been that she was hungry! If these two cases are typical, and the surgeon assures me they are, I am unable to comprehend the attitude of those who do not find any reason for exchanging ether for the H.M.C.

In the medical field this combination has proved the most effective, safe and unobjectionable remedy for severe pain as yet tested. Even where large and continued dosage with morphine had been employed, as for traumatic neuritis, a single tablet of the H.M.C.



DUNDURN PARK, HAMILTON, ONT.

has proved more effective than six grains of morphine; and instead of requiring more, the doses have been reduced. Heart diseases are no contraindication, but I believe it is not wise to administer this compound in advanced nephritis.

In surgery the field is wide, but still there are limits. The eye does not seem to come under this anesthetic's influence. For office surgery and minor operations, such as require brief unconsciousness only, this is obviously unfit, as it requires a long time for the induction of anesthesia, and this persists for hours, with a prolonged sleep following. But in traumatic cases it is a blessing. Any number of patients in a railway accident may be quickly put at ease while awaiting their turns for attention, and this is safe even without the supervision of a skilled anesthetist. How many times is the surgeon hampered in his duty by the fears and prejudices of the patient; but after one tablet of H.M.C. all this vanishes, and we are free to do what we consider preferable. Take your time to do good work—we have hours of anesthesia without additional administration. Never mind the heart—it is all right; and if the patient forgets to breathe enough and turns blue, just give him a shake (speak to him sharply and he will respond) and go ahead—he's all right. Don't get scared when he remains unconscious, just let him sleep it off. Respiration falls to 14, 12, 10, 8 per minute—well, one doctor, as an experiment, let his go to two, under repeated doses, and then held it voluntarily, he says, at one!

It will therefore be seen that in this combination, hyosine, morphine and cactin compound (for convenience and for commercial security dubbed "H.M.C., Abbott") we have a most important addition to the armamentarium of the physician and surgeon, first as a general pain-reliever, having a maximum of good effect and minimum of bad, with practically no habit-forming tendencies; second, as a producer of sedation and sleep in confinement cases, the same being made practically painless thereby, and, third, as a thoroughly satisfactory general anesthetic by itself, alone or supplemented with a little ether or chloroform. No disagreeable pumping respiration during operation and no resultant nausea or vomiting therefrom, and, being all this therapeutically, it is so with the maximum of safety and the minimum of expense.



The Canadian Journal of Medicine and Surgery

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Doctors will confer a favor by sending news, reports and papers of interest from any section of the country. Individual experience and theories are also solicited. Contributors must kindly remember that all papers, reports, correspondence, etc. must be in our hands by the first of the month previous to publication.

Advertisements to insure insertion in the issue of any month should be sent not later than the fifth of the preceding month. London, Eng. Representative, W. Hamilton Mill, Thayer House, 231 Strand, W.C. Agents for Germany, Warbach's News Exchange, Maluz, Germany.

VOL. XXII.

TORONTO, SEPTEMBER, 1907.

No. 3.

Editorials.

THE FORTIETH MEETING OF THE CANADIAN MEDICAL ASSOCIATION.

The fortieth meeting of the Canadian Medical Association will be held at Montreal, P.Q., on the 11th, 12th, and 13th of September next. This meeting promises to be of exceptional interest, owing to the nature and the importance of some of the questions which will come up for discussion. One of these is a project for



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reorganization, which aims to unite, under the ægis of the Canadian Medical Association, all the existing medical societies of Canada. The advisability of establishing an official journal of the Association will also be discussed.

As a period of forty years has elapsed since the Canadian Medical Association was founded, a summary, giving the names of the officers of the Association, with the dates and places of meeting in past years, seems *à propos* at the present time. Through the courtesy of the General Secretary, Dr. George Elliott, who has furnished the data, we are enabled to present them to our readers in this article.

"L'Association de Médecine du Canada Séance du 9, Octobre, 1867," stands at the head of the first page of the original minute book of the Canadian Medical Association. The meeting was held in the University of Laval, Quebec. Dr. Jacques Arthur Sewell, President of the Medical Society of Quebec, acted as President, whilst Dr. Alfred Belleau performed the duties of Secretary. That was the organization meeting which elected the Hon. (now Sir Charles) Dr. Tupper, President, and Dr. A. G. Belleau, Secretary. The minutes of this meeting are inscribed in French and English, as the French-Canadian practitioners of that day took a very active interest in the formation of the national medical association. One hundred and thirty-three delegates were present from the Province of Quebec, nineteen from Ontario, seven from Nova Scotia, and four from New Brunswick. Amongst the names of those present from Ontario were Drs. James H. Richardson and A. M. Rosebrugh, still living and practising in Toronto. Sir Charles Tupper was President for three years and was succeeded by the Hon. D. McN. Parker, M.D., Halifax, who held the office for one year. Both gentlemen are yet alive and in the enjoyment of vigorous health, Dr. Parker having attended the Halifax meeting in 1905. The first regular annual meeting was held in Montreal on the 2nd, 3rd, and 4th of September, 1868. There were 148 present at this meeting. The next meeting was held in Toronto on the 8th and 9th of September, 1869, when but 53 were present. Since then the places of meeting, with the year and the attendance, are as follows: Ottawa in 1870, 59; Quebec, 1871, 80; Montreal, 1872, 52; St. John, 1873, 55; Niagara Falls, 1874, 39; Halifax, 1875, 60; Toronto, 1876, 63; Montreal, 1877, 75; Hamilton, 1878, 88; London, 1879, 60; Ottawa, 1880, 73; Halifax, 1881, 53; Toronto,



WATERDOWN FALLS, HAMILTON, ONT.

1882, 94; Kingston, 1883 74; Montreal, 1884, 119; Chatham, 1885, 76; Quebec, 1886, 36; Hamilton, 1887, 87; Ottawa, 1888, 70; Banff, 1889, 82; Toronto, 1890, 107; Montreal, 1891, 135; Ottawa, 1892, 106; London, 1893, 92; St. John, 1894, 119; Kingston, 1895, 109; Montreal, 1896, 168; Montreal, 1897, 90; Quebec, 1898, 79; Toronto, 1899, 242; Ottawa, 1900, 156; Winnipeg, 1901, 177; Montreal, 1902, 340; London, 1903, 302; Vancouver, 1904, 266; Halifax, 1905, 222; Toronto, 1906, 79 (B.M.A. meeting).

The following gentlemen have been Presidents of the Canadian Medical Association since its inauguration: Sir Charles Tupper, M.D., Bart. (3 years); Hon. D. McN. Parker, Halifax; Dr. J. A. Sewell, Quebec City (deceased); Sir James A. Grant, Ottawa; Dr. W. Marsden, Quebec City; Dr. LeBaron Botsford, St. John (deceased); Dr. E. M. Hodder, Toronto (deceased); Sir William H. Hingston, Montreal (deceased); Dr. James Workman, London (deceased); Dr. J. D. Macdonald, Hamilton (deceased); Dr. R. P. Howard, Montreal (deceased); Dr. Wm. Camiff, Muskoka; Dr. G. E. Ferwick, Montreal (deceased); Dr. J. A. Mullin, Hamilton (deceased); Hon. Dr. M. Sullivan, Kingston; Dr. William Osler, Oxford, England; Dr. T. K. Holmes, Chatham; Dr. J. E. Graham, Toronto (deceased); Dr. George Ross Montreal (deceased); Dr. H. P. Wright, Ottawa (deceased); Dr. James Ross, Toronto (deceased); Dr. T. G. Roddick, Montreal; Dr. John L. Bray, Toronto; Dr. Charles Sheard, Toronto; Dr. T. T. S. Harrison, Selkirk; Dr. William Bayard, St. John; Dr. Jas. Thorburn, Toronto (deceased); Dr. V. H. Moore, Brockville (deceased); Dr. J. M. Beausoliel, Montreal; Mr. Irving H. Cameron, M.B., Toronto; Dr. R. W. Powell, Ottawa; Dr. H. H. Chown, Winnipeg; Dr. Francis J. Shepherd, Montreal; Dr. Walter H. Moorhouse, London, Dr. Simon J. Tunstall, Vancouver; Dr. John Stewart, Halifax; Dr. Alexander McPhedran, Toronto (2 years).

The General Secretaries have been: Dr. Alfred G. Belleau, Quebec (2 years); Dr. A. H. David, Montreal (12 years); Dr. William Osler (Montreal) (3 years); Dr. James Stewart, Montreal (3 years); Dr. James Bell, Montreal (3 years); Dr. H. S. Birkett, Montreal (3 years); Dr. F. N. G. Starr, Toronto (9 years); Dr. George Elliott, Toronto (elected in 1901).

The Treasurers have been: Dr. R. H. Russell, Quebec (1



BAGS OF COBALT SILVER WAITING TO BE SHIPPED.

year); Dr. H. Blanchet, Quebec (1 year) Dr. D. W. Scott, Montreal (1 year); Dr. E. Robillard, Montreal (13 years); Dr. Charles Sheard, Toronto (5 years); Dr. W. H. B. Aikins, Toronto (5 years); Dr. H. B. Small, Ottawa (elected in 1903).

There are now on the register of the Canadian Medical Association over 1,400 members.

The attendance at meetings must, in the light of the large number of members, be pronounced exceedingly meagre. It is the duty of the officers and members who do attend to discover the reasons for the apathy of the members who do not attend; to remove that apathy would be an indication of power; to explain it would indicate some skill in diagnosis and might call for the possession of unusual candor. Physicians who have enjoyed exceptional advantages for the acquisition of culture in the art, science and practice of medicine are the most constant in attending the meetings of medical associations, reaching forth, with clarity of vision and fixity of purpose, for additions to their stock of knowledge. But men of light and leading should not be singular in their devotion to the cardinal objects of such meetings. Not only does the habit of staying at home rob the attending members of a valuable and merited assistance; but the men who stay at home lose touch with their confreres and drift into the cul-de-sac of self-satisfied content. This is quite wrong; for, to give polish and completeness to one's knowledge, it should be periodically compared with the observations of others, narrowness and shallowness having no place in medical learning:

“A little learning is a dangerous thing;
Drink deep, or taste not the Pierian spring;
Their shallow draughts intoxicate the brain,
And drinking largely sobers us again.”

Besides, from the standpoint of professional solidarity, for gain or loss, for honor or dishonor, the profession must present a united front. Beneath the surface of things there is much unheralded opposition to the medical profession in Canada to-day. The wealthy please themselves and patronize physicians in a very discriminating way. The poor take all the medical skill they can get in hospitals and from friendly societies. They are profuse in granting opportunities for the exercise of skill, but they do not pay for it.



THE EEL RIVER FALLS, KAWARTHA LAKES.

Physicians should seize every legitimate opportunity to demonstrate the great benefits accorded to the individual, the family and the State by a well-trained medical profession. They should stand together in opposing, as our British brethren are doing to-day, the petty worries of fee collection, the stress of competitive commercialism, and the sweating of the profession by hospitals, friendly societies and similar organizations.

These be matters of cogency, of more interest to the average doctor in Canada than the establishment of an organization intended to embrace all the existing medical societies of this country, under the agis of the Canadian Medical Association, or the establishment and publication of an expensive Association Journal.

The provisional programme of the meeting is as follows:

Presidential Address, Dr. A. McPhedran, Toronto.

Address in Medicine, Dr. Davy Rolleston, London, England.

Address in Surgery, Dr. Ingersoll Olmsted, Hamilton, Ont.

Address in Pathology, Dr. J. George Adami, Montreal.

Discussion in Medicine, "Cerebro-spinal Meningitis." Introduced by Dr. J. J. Mackenzie, Toronto; Dr. H. A. Lafleur, Montreal; Dr. A. D. Blackader, Montreal.

Discussion in Surgery, "Hypertrophy of the Prostate": Etiology and Pathology, Dr. G. E. Armstrong, Montreal; Symptomatology and Diagnosis, Dr. F. N. G. Starr, Toronto; Treatment, Non-surgical; Treatment, Operative, Dr. James Bell, Montreal.

Section of Laboratory Workers. The following have promised papers:

Dr. G. W. Ross, Toronto; Dr. Gibson, Kingston; Dr. Rankin, Montreal. Reporting work on Opsonins.

Dr. J. J. Mackenzie, Toronto, "Generalized Blastomycosis."

Dr. Campbell Howard, Montreal, "A Study of the Eosinophile Cells of the Blood."

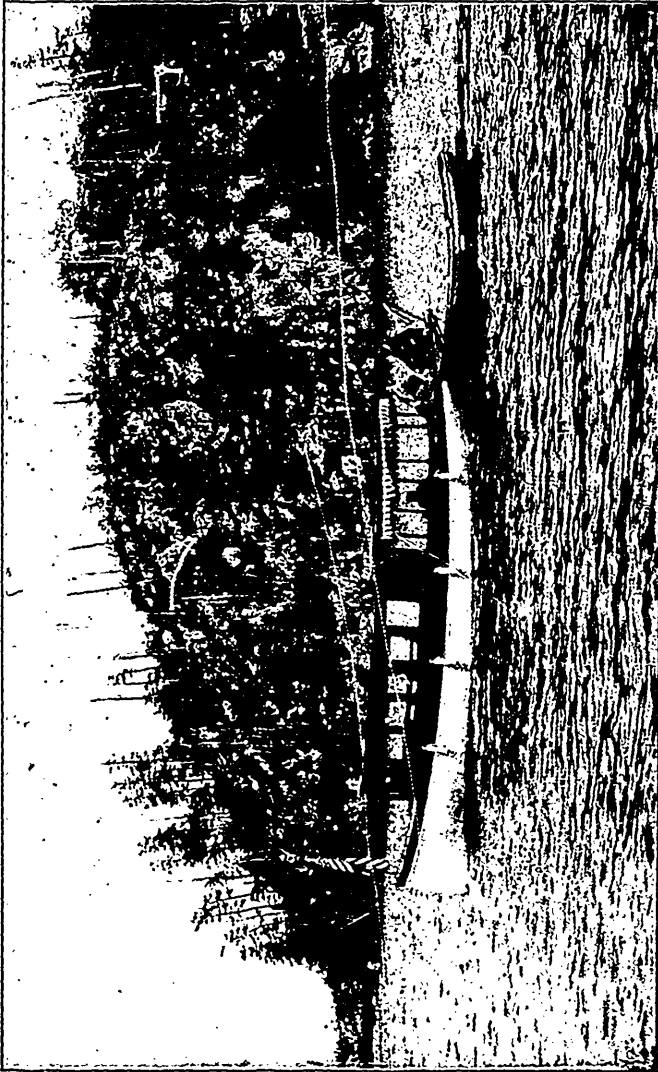
Dr. McKee, Montreal, "On Retinosis Pigmentosa."

Dr. Dixon, Toronto, "On the Significance of the Glomerula Changes in the Kidney."

Dr. J. McCrae, Montreal, "The Neuroses in the Liver in Eclampsia and Other Diseases."

Dr. Tooke, Montreal, "On Injuries of the Cornea."

Dr. Klotz, Montreal, "The Lesions in the Media of the Arteries."



ROSE POINT, GEORGIAN BAY.

The following papers have been promised:

"Listerism," Dr. A. H. Wright, Toronto.

"Seven Hundred and Fifty Abdominal Sections and the Lessons They Have Taught Me," Dr. A. Laphorn Smith, Montreal.

"Compaartive Anatomy of the Fundus Oculi," with lantern illustrations, Dr. G. Sterling Ryerson, Toronto.

"A Case of Primary Bilateral Mastoiditis," Dr. Perry G. Goldsmith, Toronto.

Title to be announced, Dr. Gordon Byers, Montreal.

"Notes on Tubercular Bacilli Isolated from Fatal Cases of Primary Cervical Tubercular Adenitis," Dr. Duval, Montreal.

"Bacteremia Colon, Its Diagnosis and Its Diagnostic and Prognostic Value," Dr. Fraser Gurd, Montreal.

"Cancer of the Breast," Dr. George E. Armstrong, Montreal.

"Modern Methods in Diagnosis of Tuberculosis of the Kidney," Dr. R. P. Campbell, Montreal.

"Clinical Side of Ectopic Pregnancy," Dr. W. W. Chipman, Montreal.

"Danger Signals in Anesthesia," Dr. Samuel Johnston, Toronto.

"Psychology of the Sick Room," Dr. John Hunter, Toronto.

"Paresis: Certain Features in Regard to the Etiology and Differential Diagnosis," Dr. John G. Fitzgerald, Toronto.

"The Normal Temperature," Dr. R. D. Rudolf, Toronto.

"The Rights of Children," Dr. C. J. C. O. Hastings, Toronto.

"The Defensive Action of Products of Metabolism," Dr. Graham Chambers, Toronto.

"Treatment of Neurasthenia," Dr. E. C. Burson, Toronto.

Papers are also expected from the following: Dr. Connell, Kingston; Dr. Keenan, Montreal; Professor Harrison, St. Anne de Bellevue; Dr. A. W. Moody, Winnipeg; Dr. W. F. Hamilton, Montreal; Dr. F. G. Finley, Montreal; Dr. C. F. Martin, Montreal; Dr. Colin Russell, Montreal; Dr. Campbell P. Howard, Montreal; Dr. A. G. Nicholls, Montreal; Dr. Ridley Mackenzie, Montreal; Drs. Lyman and D. A. Shirres, Montreal; Dr. B. W. D. Gillies, Vancouver; Dr. A. H. Gordon, Montreal; and from Drs. Lowrey, H. B. Anderson, H. C. Parsons, W. B. Thistle, R. J. Dwyer and A. R. Gordon, Toronto.

"When and How to Resume Normal Feeding in Convalescence from Typhoid Fever," Dr. J. T. Fotheringham, Toronto.



THE RAPIDS OF THE FRENCH RIVER.

Dr. Maud E. Abbott, Montreal, will present an exhibition of pathological specimens from the McGill Medical Museum, illustrating the circulatory system.

Prof. J. J. Mackenzie, Toronto, will also exhibit pathological specimen.

Dr. Robert Wilson, Montreal, will give an exhibition of X-ray plates from the different hospitals.

"The Occurrence of Congenital Adhesions in the Left Common Iliac Vein," Dr. J. Playfair McMurrich, Toronto.

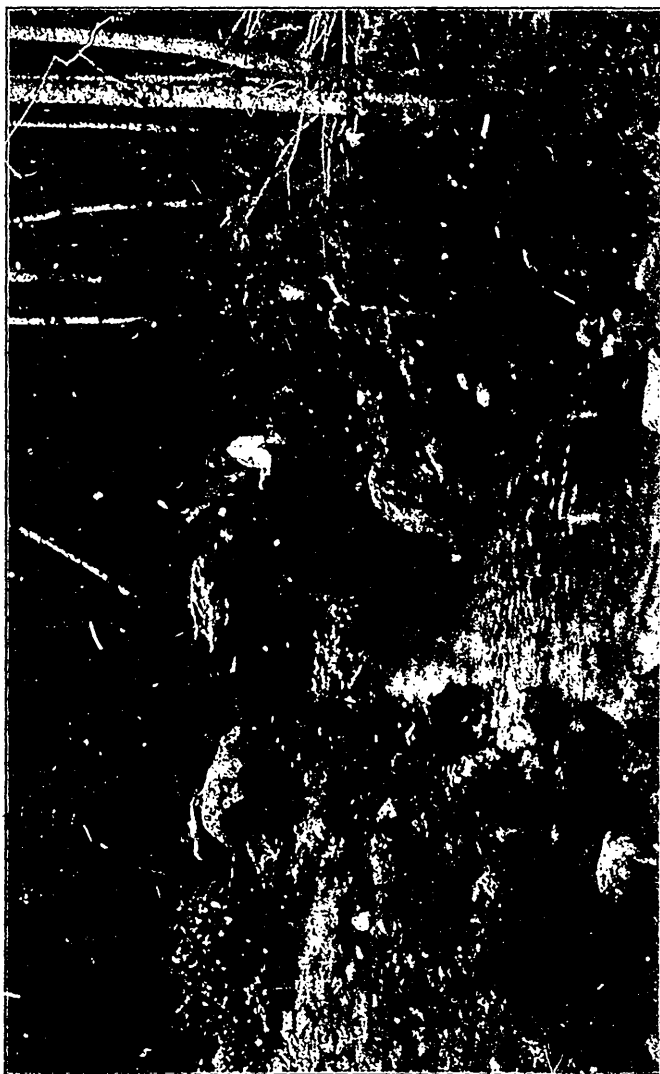
"Sigmoiditis and Diverticulitis of the Rectum," Dr. D. A. I. Graham, Toronto.

Ample accommodation has been provided in the Arts Building, Peter Redpath Museum, the Physics Building and the McGee Union. The lecture halls are provided with lanterns, and it is hoped papers will be illustrated by this means. Interesting clinical material will be shown at the Royal Victoria Hospital, Montreal General, Notre Dame Hospital and the Hotel Dieu on the mornings of the meetings at 8.30.

J. J. C.



LAKEHURST, SANATORIUM, OAKVILLE, ONT.



A HIGHLAND STREAM, HIGHLANDS OF ONTARIO.

News of the Month.

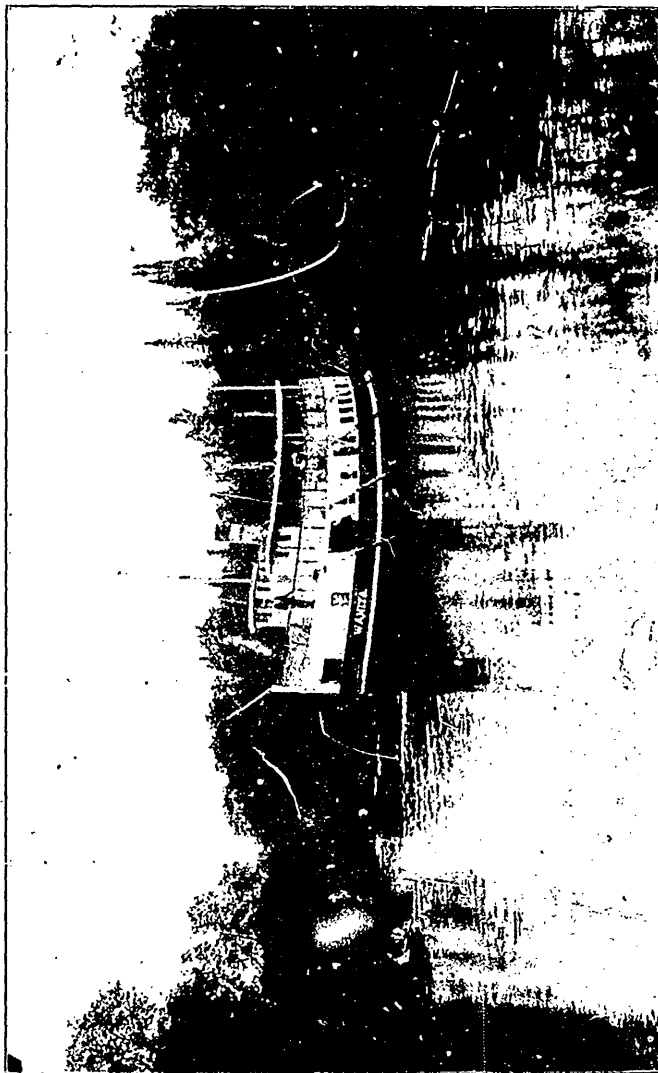
ITEMS OF INTEREST RELATING TO THE MEETING OF THE CANADIAN MEDICAL ASSOCIATION.

WHEN it is remembered that over eight hundred Canadian physicians registered the first day of the British Medical Association meeting in Toronto last year, surely it is not too much to expect that at least three hundred will journey this year to Montreal to the fortieth annual meeting of their own national medical organization. If three hundred are present with Standard Convention Certificates all will be returned home free.

How to Get There and How to Get Home.—The Standard Certificate plan prevails in every Province, no one requiring any certificate from the General Secretary. This means that all delegates, on purchasing single first-class tickets to Montreal, for themselves, their wives and daughters (no others) should ask for and get, at the same time, a Standard Convention Certificate, from the ticket agent for each. These, when signed by the General Secretary at the meeting will entitle holder thereof to reduced transportation, which in all cases must be arranged for at Montreal. If three hundred are present holding these certificates, all will be returned home free; one-third fare if fifty are present with certificates.

Railways and Steamboats.—The Canadian Pacific Railway, the Grand Trunk Railway, the Intercolonial Railway, all lines in the Eastern Canadian Passenger Association, and the Richelieu and Ontario Navigation Company and Canadian Northern Railway, are included in the transportation arrangements. Delegates from points west of Fort William will be permitted to use the Upper Lake Route, Fort William to Owen Sound, or *vice versa*, on extra payment of \$4.25 one way or \$8.50 both ways, when traveling on the Standard Certificate Plan. Passengers going by rail, returning Richelieu and Ontario Navigation Company, or *vice versa*, rate to be one and one-half fare. Tickets will also be honored via R. and O. Nav. Co. on presentation of rail excursion ticket to the ticket agent at Toronto, or to the purser on board steamer and payment of the following arbitraries, viz., \$6.65, Toronto to Montreal; \$3.50, Kingston to Montreal.

Those desiring to tour should consult with their local railway agents as to tourist tickets.



ON THE MAGNETAWAN RIVER.

Comparative Schedule of Transportation Rates to Montreal.—From Victoria, \$74.55; Vancouver, \$74.55; Calgary, \$59.50; Strathcona, \$62.15; Rossland, \$67.05; Nelson, \$67.05; Medicine Hat, \$53.20; Regina, \$43.95; Brandon, \$37.60; Winnipeg \$34.55; Kenora, \$34.55; Fort William, \$29.25; Port Arthur, \$29.15; Soo, Ont., \$18.00; Windsor, \$15.00; Chatham, \$14.75; London, \$12.95; St. Thomas, \$12.75; Woodstock, \$12.10; Galt, \$11.60; Toronto, \$10.00; Guelph, \$11.45; Hamilton, \$10.65; Peterboro', \$7.35; Ottawa, \$3.35; Kingston, \$5.30; Quebec, \$4.90; St. John, N.B., \$14.30; Halifax, N.S., \$18.45; Sydney, C.B., \$21.75.

Dates of Sale of Tickets, Time Limits, etc.—Tickets will be on sale in the Eastern Canadian Passenger Association territory—Port Arthur to Halifax—three days before first day, Sunday not counted a day, and final return limit three days after the last day. From British Columbia points tickets will be sold and certificates issued on September 1st and 2nd, and validated certificates honored for return tickets up to and including October 9th. Tickets good for continuous passage only in each direction. West of Port Arthur and Fort William, the selling dates are September 5th, 6th, 7th and 8th. From stations west of Winnipeg tickets to be good going *via* trains that will connect with those leaving Winnipeg the before-mentioned dates; certificates to be honored at Montreal up to and including October 11th.

Place of Meeting in Montreal.—The meeting place will be the McGill University Buildings. The general meetings will be held in Mason Hall, the Medical Section in the lecture-room of the Redpath Museum, and the Surgical and Pathological Sections in the lecture-rooms of the Arts Building.

Certificate Fee.—The railway officer at Montreal, when exchanging Standard Convention Certificate for return transportation, will collect from each, for vising the same, a fee of twenty-five cents.

Hotel Accommodation.—Delegates desiring to have hotel or lodgings reserved for them should apply to the Local Secretary, Dr. Ridley Mackenzie, 192 Peel Street, Montreal.

Membership.—The fee for membership is \$2.00, and may be paid to the Treasurer, Dr. H. Beaumont Small, Ottawa, at time of registering. For the information of those who will apply for membership for the first time, the same transportation rates apply to them as well, and they are requested to ask for application for membership forms when registering.

The Social Side at Montreal.—There is to be a garden party at Terrace Bank through the kindness of Dr. and Mrs. Roddick, a smoking concert in the Victoria Armoury, a reception after the President's Address the first evening in the Student's Union Build-

ing, a drive and luncheon at the Hunt Club for the ladies, golf matches, etc.

Canadian Medical Protective Association.—During the meeting of the Canadian Medical Association, as usual, the annual meeting of the Canadian Medical Protective Association will take place. Dr. R. W. Powell, Ottawa, the President of the C.M.P.A., will deliver the annual address and present the annual report.

Military Surgeons.—There will also be a meeting of Canadian Military Surgeons, an organization which the Director-General of the Army Medical Service, Lieutent-Colonel Carleton Jones, M.D., is promoting.

Re-organization.—Full discussion will take place on the report of the Special Committee on Re-organization. For this reason alone there should be a large and representative delegation from each province.

Additional Information.—Additional information of a local character may be obtained from the Local Secretary, Dr. Ridley Mackenzie, 192 Peel Street, Montreal; any general information from the General Secretary, Dr. George Elliott, 203 Beverley Street, Toronto.

Some of the Canadians Who Attended the Exeter Meeting of the British Medical Association.—The following medical men from Canada attended the meetings of the British Medical Association at Exeter: Dr. Birkett and Professor Starkey, McGill, Montreal; Professor Irving Cameron, Dean Reeve, Drs. Baines, Bruce, Mayburry, Oldwright, Temple, Fred Starr and Doolittle, of Toronto; Dr. Burt, Paris, Ont.; Dr. Atherton, Fredericton, New Brunswick.