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Original Communications.

LISTERISM—ANTISEPSIS AND ASEPSIS.*

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The personality and the work of Lord Lister are both singularly unique. His nobility of character, his remarkable modesty, and his exquisitely charming manner combine to make him a very lovable man. To appreciate to any considerable extent these traits in Lister one must have some acquaintance with him—to appreciate them fully, we are told, one must know him intimately. Fortunately we in Canada know him fairly well, and we certainly love and respect him very highly.

From a professional as well as a humanitarian standpoint we have to consider his magnificent work in surgery. It is quite unnecessary, however, to go into details. What Lister has done for surgery, what he has done for humanity cannot be properly described in words; but the whole civilized world worships him as a hero, and a wonderful epoch-maker.

We shall presume that Listerism includes the principles and practice of antiseptic and aseptic surgery. Several years ago Sir Frederick Treves spoke as follows: "Lister created anew the ancient art of healing; he made a reality of the hope which had for all time been the surgeon's endeavor; he removed the impenetrable cloud which had stood for years between great principles and successful practice, and he rendered possible a treatment which had hitherto been but the vision of the dreamer. The nature of his discovery—like that of most

* Read at meeting of Canadian Medical Association, Montreal, 1907.

movements—was splendid in its simplicity, and magnificent in its littleness. To the surgeon's craft it was the one thing needful. With it came the promise of a wonderful future; without it was the hopelessness of an impotent past."

We find that a certain amount of confusion has arisen in regard to the terms antiseptis and asepsis, and also in regard to antiseptic and aseptic methods. A writer on this side of the Atlantic, voicing the opinions of a certain number, says: "The theory and practice of what is known as antiseptic surgery are rapidly giving place to the more rational science and art of aseptic surgery." A writer in Great Britain says: "Antiseptic surgery was the forerunner of aseptic surgery. It was found that it was unnecessary to attempt the continual destruction of germs if there were no germs to destroy. Hence arose the present aseptic system."

Another writer in Great Britain (Sir Hector Cameron), says: "Every treatment which is directed against sepsis, no matter what the means be which are employed, is surely antiseptic treatment." He also tells us that the word asepsis was devised by Lister to denote the condition of a wound from which sepsis is absent. In the early days of Lister's treatment some surgeons spoke of a wound as being "in an antiseptic condition"—and of an operation as being followed by "a thoroughly antiseptic result." It was to avoid such awkward phraseology that Lister suggested the adoption of the word aseptic, a word which he afterwards found had been used by Hippocrates. Sir Hector adds: "To speak of the aseptic treatment of wounds is clearly as confusing and inelegant as to speak of the antiseptic condition of wounds." (*British Medical Journal*. April 6th, 1907.)

Many (I hope most) of us concur in Sir Hector's opinion that the word aseptic has been sadly misapplied, but we must recognize the fact that the terms antiseptic and aseptic are now applied to surgical methods in a somewhat definite way. The antiseptic treatment of wounds includes preliminary disinfection of skin, hands, instruments, etc., the use of antiseptic solutions during the operation, and subsequent dressings. The aseptic treatment of wounds includes also preliminary disinfection of skin, hands, instruments, etc., but not the use of antiseptic substances during the operation nor in the subsequent dressings.

Professor Kocher, of Berne, may be cited as one who has been much misunderstood. He himself is partly responsible for such misunderstanding, because he uses the terms aseptic

and antiseptic, according to his translator, in a vague and perplexing way. For instance he speaks of aseptic wounds, aseptic methods of operation, and aseptic cases. He does not, however, as I understand him, disassociate aseptic from antiseptic methods. For instance he always uses antiseptic ligatures, *i.e.*, ligatures carefully prepared first in ether, second in alcohol, and third in a 1-1000 solution of corrosive sublimate. He also uses "thin silk because it is more easily impregnated"; and he states definitely that "it is only antiseptically prepared silk which safeguards us against both primary and secondary infection." Professor Kocher has been chosen for special mention because of his deservedly distinguished position in the surgical world, and because we have been so frequently told that his methods are purely aseptic according to the modern definition of the word as given above.

Many English surgeons acknowledge that antiseptics are more or less irritating, and therefore should be used carefully and judiciously. They think that the aseptic methods require more attention to details than the antiseptic methods, and also that they are quite "incompatible with private practice" (Sir Hector Cameron). Cheyne and Burghard express a positive opinion that the aseptic methods can only be carried out by skilled and experienced bacteriologists in well equipped hospitals. They believe that it is almost impossible to carry out the methods in all their details in private practice. When great surgeons of England and other countries hold these views the surgeons who teach aseptic methods to medical students are assuming grave responsibilities. Lister aimed at simplicity in surgical practice and taught methods which could be carried out in the "backwoods," as well as in the best modern hospitals.

In the interest of suffering humanity one may ask: Would the general adoption of the modern aseptic methods instead of the antiseptic methods be an advance movement or a retrograde step? Would it be well to advise our graduating classes to use aseptic dressings, and avoid antiseptic dressings, in the treatment of compound fracture?

We probably all agree that the main feature in surgical treatment is absolute cleanliness. It happens, however, that if we have not learned certain "simple" lessons from Pasteur and Lister we do not understand what cleanliness means. When men are taught that nothing is required in their work except cleanliness a large proportion of them will soon become dirty in a surgical sense (and sometimes otherwise). May not a

similar thing happen if we teach that aseptic methods are to be employed and antiseptic methods avoided?

It happens fortunately that at the present time both the antiseptic and aseptic methods are producing admirable results. Under such circumstances we are loath to offer adverse criticisms as to the work of those who are employing aseptic instead of antiseptic dressings to such a large extent. We may even admire the paraphernalia though we cannot always understand it in all the details. I was slightly perplexed on one occasion when I saw a bald-headed surgeon, properly arrayed in white robes, with a white cap on the top of his head, and his copious beard uncovered, and waving gracefully over the field of operation. I presume that Mikulicz when alive would not have been quite satisfied in such a case.

This subject is very important from an obstetrical standpoint; and for that reason those who practise the art of obstetrics watch closely the methods of the surgeons and study carefully the results of their work. Many obstetricians recommend what they term aseptic midwifery, but they all, so far as I know, advise antiseptic methods when they deem them necessary to secure aseptic results.

For the sake of brevity I shall give my own opinions on a few points in connection with this large subject without discussing in detail the views of others. It seems fitting to recommend *antiseptic and aseptic midwifery*, especially if aseptic methods are to be considered by some "more rational" than antiseptic methods. Whether we call labor a physiological or a pathological process we know that we have wounds and bruises in the majority of cases.

To prevent confusion as to certain simple terms it will be considered that "sterile" means, free from all micro-organisms; "aseptic" means, free from septic micro-organisms.

Our field of operation is composed of:

1. Septic tract, comprising vulva and all adjacent parts. The skin covering these parts is septic, and cannot be made aseptic; and, therefore, wounds of the fourchette and perineum are septic, or soon become so.

2. Aseptic tract, comprising the vagina, and lower part of the cervical canal. We learn from bacteriological research and from clinical observation that the vagina of pregnancy, although it contains many organisms, is aseptic, *i.e.*, it contains no pathogenic germs. Even when streptococci are introduced from without they are soon destroyed by the vaginal secretions. This is true as to all cocci with the single excep-

tion of gonococci. As a consequence, when there are no gonococci present, wounds of the vagina and the cervix are aseptic.

3. Sterile tract, the uterine cavity.

Let us consider what occurs in a normal labor left entirely to Nature. After uterine contractions have continued for some hours the parts are dilated. The membranes are ruptured, and a certain amount of sterile fluid is poured into and through the vagina, and some organisms are washed out. The head and body soon pass through the vagina, and delivery results. During their passage the mucous membrane of the vagina is stretched and made smooth, and more organisms are pushed out. Then follow more liquor amnii and blood, shortly after the placenta, then come blood and lochia for some days. We shall suppose there was a tear of the cervix, a tear of the vagina, and a tear of the perineum, the tear in each case being a slight one. The woman makes a good recovery, although, or perhaps because, no doctor or midwife has touched her. What became of the wounds? The edges of the cervical wound came together. The cervical mucous membrane on one side and the vaginal mucous membrane on the other side were covered with a certain amount of sterile fluid. No finger, no instrument, no stream of water separated the edges of the wound, or introduced septic germs. The wound healed rapidly, probably by first intention. The vaginal wound healed in a similar way. The flow of the fluids, which are sterile for sometime, continually in an outward direction, had kept these wounds aseptic. We can probably agree thus far, although we may disagree as to whether the vaginal canal has been made absolutely sterile in the meantime. Without discussing that point, which is not important at this juncture, we have to consider the perineal wound, which has not fared so well as the others. The edges came together, but did not remain in good apposition. Some pathogenic germs soon entered from the septic skin, and an interesting conflict occurred. The sterile fluids at first washed the organisms away. After a time these fluids diminished and some of the septic organisms remained, but these were attacked by cells of the living healthy tissues, and held in check. In the meantime lymph has been thrown out, granulations were formed, and by the fourth day had filled the wound, and danger of absorption had passed. Young fibrous tissue was developed, considerable contraction took place, epithelium spread over the surface, and the wound was soon healed. Nature in this instance did magnificent work in her own inimitable way. He is a wise man and a good

physician who does not interfere with Nature in such a case. Our great desire in the practice of obstetrics is to obtain a knowledge which will enable us to assist Nature in an intelligent way. Our aim is to avoid both extremes—the meddling and the careless methods.

As to antisepsis and asepsis we in Canada do not differ on certain important points. We think that the patient, her surroundings, the accoucheur and his assistants (if there be any) should be clean. As a matter of routine we generally use rubber gloves in the Burnside Lying-in-Hospital. Our rule is that the attending accoucheurs may, and the internes must, use them. In cases of sepsis the gloves should always be worn both in the interest of the operator and also in the interest of the patients he subsequently attends. Of course the hands should be as clean as possible, with or without gloves. Our custom is to use antiseptic solutions during labor, especially as to our hands and vulvar dressings. Even those who practice aseptic surgery will not probably object to this in midwifery practice.

As before mentioned it is generally recognized that the vagina is an aseptic tract. On this account many obstetricians in various parts of the world use simple sterile gauze for plugging the vagina before labor. It happens, however, with such material that the tampon becomes foul in twelve hours, while with iodoform or some other form of antiseptic gauze the tampon may be left in one or two days (or more in some cases) without becoming foul. It is generally conceded now that antipartal douching is unnecessary if not harmful.

There are two or three other matters of vast importance to which brief reference will be made. In doing so it will be more convenient for me to speak in the first person. In the first place I do not think that the vagina ever becomes, nor do I think that it can ever be made sterile by either the surgeon, the gynecologist or the obstetrician. After labor, though a number of organisms may be flushed out and forced out by the passage of sterile discharges, child and placenta, some of these organisms remain. If lochial discharges are retained in the vagina for a few hours they always become foul through the action of these (let us call them) saprophytic germs. Then these organisms multiply with great rapidity, pass up into the uterus, cause decomposition of the blood, bits of placenta, or membranes. We have then foul lochia and constitutional symptoms indicating sapremia.

Local treatment together with the administration of calomel

and saline cathartics will generally cure in such cases. Let the patient be anesthetized. Introduce the gloved hand within the vagina and fingers within the uterus. Scrape gently the debris from the uterine wall, wash out the uterine cavity with a hot salt solution, pack the uterine cavity fairly tightly, and the vaginal vault somewhat loosely, with 5 per cent. iodoform gauze. This gauze may be left in the uterus for twenty to thirty hours, *i.e.*, it may be introduced one day and removed at almost any time the next day. In nearly all cases of pure sapremia this treatment carried out within three or perhaps four days after labor will produce satisfactory results. This is practically Dührssen's method, as recommended something like fifteen years ago, and is simply one of the modifications of intrauterine treatment which have been carried out for about twenty-five years. These methods were so successful that they encouraged surgeons and obstetricians to employ very radical methods of intra-uterine treatment in cases of septicemia with most disastrous results. Strong antiseptic solutions were injected into the uterine cavity, and caused more or less necrosis of the tissues. Curettes sharp and dull were used with most deadly effect. Fortunately there has been a reaction during the last few years. With many who still believe in intrauterine medication for septicemia alcohol is considered safer than carbolic acid and other strong germicides. Many of us hold the opinion that no metallic curette should ever be introduced into the puerperal uterus. When I see in consultation a patient with serious symptoms after labor, and find that the attending physician has used a curette, I form the opinion that if the patient has sapremia she may recover; if she has septicemia she will die.

While one intrauterine douche may be of use, especially when one suspects sapremia, the continuation of such douches when no offensive debris is washed out, *i.e.*, when the patient has septic infection, is always injurious. Even in cases of sapremia one treatment, as described, is generally sufficient.

There is another class of cases which cause much anxiety. Take the following example: A healthy primipara had slight fibrile symptoms commencing the second day after labor; some odor in lochia third day. Dr. A., who had charge, ordered vaginal douches; some improvement on the fourth day; but the patient is not quite well for the three following days. Dr. B. saw the patient with Dr. A. on the seventh day. Pulse was 100, temperature 100 deg., some malaise, lochia was slightly offensive. Local treatment was carried out as follows:

Patient anesthetized, rubber gloves used, hand in vagina, fingers in uterus, gently scraped the walls; little debris, slightly decomposed; weak antiseptic douche used; utero-vaginal iodoform gauze tamponade; plug removed the following day; patient grew worse after this treatment; had the ordinary symptoms of a somewhat acute septicemia. Died in about sixteen days after this treatment, or twenty-three days after delivery. Post-mortem examination showed septicemia.

Let us suppose that this was at first a mild sapremia. We are told that streptococci are frequently found in cases which are clinically diagnosed as sapremia. It seems probable that the presence of saprophytes attracts in some unexplained way streptococci, which are practically ubiquitous, and perhaps increase their virulence. In this instance there was probably a mild sapremia followed by, or accompanied by, a mild septicemia. Nature was making a vigorous fight against the invading organisms and their toxins. She was throwing out a wall of cell infiltration, which was acting both as a barrier against the organisms, and a filter of the toxins. This is something like the granulation tissue which we find in external wounds. Within this layer of tiny cells, or "reaction zone," we find a necrotic zone containing the attacking organisms.

In carrying out any local treatment we have to consider this reaction zone. If, by our manipulation we injure some of these tender cells we open vessels which will at once allow the ingress of the attacking organisms. There seems but little doubt that even the smooth gloved finger tips frequently injure enough of these tender cells to practically destroy the barrier which keeps these little enemies out of the system. If it be granted that manipulation either with the finger tips or with a curette is dangerous the question arises—What are we to do? We have found that antiseptic solutions which are strong enough to destroy virulent streptococci cannot be injected with safety into the uterine cavity.

Without further comment I desire to express my opinion (and I do so with much diffidence) that after the fourth day following labor, neither the finger nor the curette should be introduced into the uterine cavity. If there is an offensive discharge, not due to retention of lochia in the vagina, an intrauterine douche of warm salt solution may be used. If the return flow brings away some debris the douche may be repeated once or twice at intervals of some hours. If the return flow is clear the douche should not be repeated. In administering the douche no hard nozzle should be used. The

operation, even when performed with the greatest care, is probably not free from danger. Most of our modern surgeons do not consider it advisable to wash out a septic wound, but they all desire free drainage. It seems probable that many obstetricians do not pay sufficient attention to the drainage from the uterus and vagina. Much can be done to promote free drainage from the organs by raising the shoulders of the patient, and turning her slightly to either side, at regular intervals.

In considering the surgical aspects of obstetrical procedures we desire to acknowledge the great debt we owe to the surgeons; and our methods of treatment, as learned largely from them, may be briefly summarized as strict antiseptis for the external parts and strict asepsis for the internal parts. And let me say in conclusion that for the measure of success which now attends our efforts on behalf of woman in her hour of need—to Lister be all the honor and all the glory!

ADDRESS IN SURGERY.*

INGERSOLL OLINSTEAD, M.B., HAMILTON.

The honor of being chosen to deliver the address in surgery at the meeting of this Association is one I had not expected. After looking over the names of the distinguished gentlemen who have filled this honorable position, I feel any words of mine quite inadequate to express my gratitude to you, and it is with mingled feelings of pleasure and anxiety that I attempt to speak of the advances which surgery has made during the last few years. Not having had the extensive clinical experience of many of the gentlemen who have addressed you in the last few years, I shall only attempt to draw your attention to some of the most important work which has been done in different countries.

In surgery especially, has the English speaking people contributed more than their share of good work, and America particularly, should be proud to be favored by the visits of distinguished surgeons from abroad.

Great advances have been made in the surgical treatment of diseases, yet in many instances our hopes have not been realized. Thus when the tetanus bacillus was isolated, and a serum prepared, it was thought a treatment had been found that would ward off the usual fatal termination of this disease. This has now been found to be erroneous, and, in fact, the use of antitetanic serum has almost been abandoned in the treatment of cases of tetanus. Fortunately, however, the serum is almost a certain preventative of the disease. Thus, in 1903, in the United States there were 406 cases of tetanus reported, following accidents received during the Fourth of July. In the present year only 73 cases were reported. This marked improvement is attributed to more careful treatment of the wounds, and the administration of the antitoxin. In a recent discussion of this disease before the Surgical Society of Paris, Berger stated that during the last seven years all patients, with one exception, entering his wards with wounds in which there was a possible infection with the tetanus bacillus, received a small dose of antitetanic serum. The one patient who had not received the serum was the only one that developed tetanus.

It is now the rule in many hospitals in America, to give the serum in all cases having wounds which could have become soiled by dirt, manure, or other foreign substances. The

* Delivered at the meeting of the Canadian Medical Association, Montreal, 1907

serum should be repeated, as a single dose will not always prevent the disease. Suter and James Bell have each reported a case where tetanus developed forty-seven days after a single prophylactic dose of the serum had been given.

Although hemophilia is a comparatively rare condition, it comes to our attention at times in a very realistic manner. It is very disagreeable for a surgeon to be called to operate on some acute surgical condition, when the patient is affected with this interesting blood state. The use of calcium chloride and subcutaneous injections of gelatine, although at times very useful, fail to check the copious oozing in subjects of this disease.

Hemophilia is presented in two distinct etiological conditions, first accidental, and second hereditary. In the accidental variety there is no history of heredity, or injury, or previous serious disease. Its course is more or less benign, and occurs at less frequent intervals, and requires a more serious injury for its production. In the hereditary variety, on the contrary, the tendency to hemorrhage follows the slightest wound, owing to the fact that coagulation is very much retarded. Enile Weil has shown that fresh human or animal serum introduced into the system of patients affected with hemophilia produces a marked increased coagulability of the blood in the hereditary variety, and in the accidental variety the coagulation becomes normal. This followed the intravenous injection of twenty cubic centimeters of animal blood serum. The change in the blood occurs about twenty-four hours after the introduction of the serum. Locally the serum has much the same action.

It appears that in the accidental form of hemophilia there is an absence or diminution of the ferment which causes coagulation, while in the hereditary form there seems to be some anti-coagulating substance. If the antidiphtheritic serum be used, and this is the one most easily obtained, it should be fresh. Numerous observers have confirmed the beneficial effects of this method of treatment, and it certainly should be given a trial. If the serum be given subcutaneously 20 or 30 cubic centimeters should be used.

With our present methods, the brain may be examined with comparative safety, yet there is still much to be desired. The unfortunate results which have formerly followed cerebral hemorrhage in the new-born, can, by the intermusculo temporal operation, be frequently relieved. In most of these cases the labor is protracted, and the child is asphyxiated as a

rule when born. Even the most desperate cases should be given a chance. There are usually localizing symptoms, yet one should not hesitate to open both sides of the skull if necessary. This is also indicated in fracture of the base. Undoubtedly many patients have died from compression, which would have been saved had the skull been opened. The convalescence is much quicker, and the recovery better. I can recall several cases of fracture of the base with extensive hemorrhage that were relieved by this means.

In cases of papillary edema due to cerebral compression, a decompression operation will ward off the symptoms. In one case operated on for Dr. Osborne, the sight, which was rapidly failing, made rapid improvement after the operation. An early interference is necessary in order to forestall atrophic changes in the nerve, and a large sized disk should be removed.

For severe cases of tic douloureux, the evulsion of the sensory root of the casserian ganglion removes the pain, and leaves no bad after effects. Cushing has operated on 54 cases of this disease with only two deaths. This operation is simpler than removing the ganglion and the results are really better. Where the attacks of pain are not so severe, Charles H. Mayo exposes the nerves at the points of exit from the foramina, extracts them by slow evulsion, cuts them off, and then plugs the bony openings by driving in small silver nails. This is an operation void of danger and easy to perform.

The injection of 70 per cent. alcohol into the nerves is also very effectual in many cases of intractable neuralgia. In spasmodic tic, the facial nerve may be resected and anastomosed with the spinal accessory. The result in a case I saw, which Cushing had operated on, was extremely satisfactory.

Since operations on the thyroid have become frequent during the last few years, attention has been drawn to the importance of the parathyroid bodies. Although these structures were first accurately described by Sandstroem in 1880, their function remained a secret for many years. It was then found that when these bodies were removed a true tetany developed, which led often to a fatal termination. These parathyroid bodies are often difficult to distinguish during the removal of the thyroid, being situated usually where the thyroid vessels enter the gland. They get their blood supply apparently from the thyroid vessels, and hence, if a complete thyroidectomy be made, the main trunk of the vessel should not be ligated, but rather the branches as they enter the gland. Halsted usually leaves the upper pole of the thyroid where the superior thy-

roid enters. One of the dangers of this procedure is the liability of secondary hemorrhage. Dr. Charles H. Mayo leaves the posterior capsule of the gland, believing by this procedure that the parathyroids will be uninjured. Halsted, who had an unfortunate experience in one of his cases, does not think that Mayo's procedure will preserve the integrity of these important bodies. He has successfully transplanted parathyroids in the spleen of a dog, and also into the opposite half of the gland. Von Eiselsberg had two cases of grave tetany following thyroidectomy during the past four years, and in both cases the administration of the dry parathyroids successfully relieved the condition. In one case of tetany of long standing, he transplanted into the abdominal wall, a parathyroid gland taken from a patient operated on for goitre. The result was very good indeed, as the tetanic symptoms were very much improved. The rectus muscle and spleen are eminently suitable structures for such transplantation.

If only one-half of the gland be removed, together with the isthmus, the destruction of the parathyroids on this side of the body will not influence the health of the patient, yet in this operation I believe these bodies should be preserved if possible, otherwise it would be dangerous to operate later on the other half, a condition, however, which fortunately, seldom occurs. Partial thyroidectomy has been very successful in the treatment of exophthalmic goitre or Graves' disease, yet it is an operation difficult of execution, and quite dangerous.

The treatment of the gland with X-rays for some weeks before operation, will, it is said, toughen the tissues, thereby lessening the danger of hemorrhage, and perhaps also that of acute thyroidism. This latter danger, I believe, the greater of the two, and for this reason the gland should be freely exposed before attempting its removal, and free drainage should be provided.

The treatment of essential epilepsy by resection of the cervical sympathetics has not been attended by sufficient success to warrant the belief that much amelioration will result from it. The reports of cases operated on vary so much, that one unconsciously feels that the reporters in many cases, are not unbiased. In the cases that have been followed for years after the operation, a return of the attacks has been the rule, just in fact, what one would expect where the procedure is lacking in the pathogenic basis.

The excellent experimental work of Carrell has given rise to great advances in surgery of the arteries and veins. Many

investigators have now been able to transplant kidneys, thyroids, etc., and it is difficult to say to what extent these experiments may benefit the human being. Arteries are now sutured when injured, and it is found that they heal quite readily. In January, 1903, I closed a small transverse wound of the femoral artery with fine silk sutures, and it healed perfectly, with apparently no thrombus, as the tibials pulsated normally afterwards. The patient, a farmer, lived for about two and a half years, doing his ordinary work, and died from a lightning stroke.

The improved method of treating aneurism by opening the sack, removing the fibrin and clots, closing the vessel openings by sutures, and then obliterating the sack, is now generally employed by surgeons. The sacciform aneurism may be cured by this, the Matas operation, without destroying the usefulness of the vessel. In fusiform aneurism, Halsted has devised a silver band with which he contracts the lumen of the vessel, without completely cutting off the circulation. His experience with this method has been encouraging.

For many years, only the simplest operations were attempted in the thoracic cavity. Now, however, if there is a wound of the heart or lungs, the injured part is exposed and the wound sutured.

We have learned that these tissues heal readily, provided that there be no infection, or infection of a mild grade only. During the last few years numerous cases have been reported where the heart has been successfully sutured, and indeed in many of these cases the patient was in a very dangerous state before the operation.

With Sauerbruch's pneumatic chamber, the chest may be opened without shock due to collapse of the lung, and I believe the time is not far distant when every well regulated hospital will be provided with a special room for operating on lung cases. Even at the present time many cases of gangrene and abscess of the lung are cured by an early operation. It is difficult to distinguish between abscess and gangrene of the lung, yet for all practical purposes the diagnosis is unimportant as the treatment is the same in both conditions. The main point is to open early, before extensive changes have taken place. If one waits until the abscess wall becomes very thick, with infiltration and induration of the surrounding parts, or where, through aspiration, other parts of the lung become involved, the prognosis is not nearly so good. An X-ray examination will aid very much in the localization of

the disease. The aspirating needle is a dangerous instrument in such cases, as its employment subjects the patient to increased risks of infection.

In the early operation, simple thorough drainage will usually be followed by recovery, otherwise, free resection of the ribs becomes necessary. Where a fistula is left after an abscess has been drained, the lung may be resected. Even the whole lower lobe has been successfully removed, with cure of the patient. When Sauerbruch's chamber is not available, the careful application of sutures which attach the pulmonary to the parietal pleura should be made. Where further security is desired, and the condition of the patient permits, a weak iodoform gauze tampon may be applied to the pleura, and allowed to remain for one or two days before opening the diseased focus.

An interesting point in connection with the anesthetic, is, that it is only needed at the beginning and end of the operation, as the lung and pulmonary pleura are not sensitive to pain.

Diseases of the stomach and duodenum have been discussed so much during the last few years, that it seems superfluous to say anything about them, yet many of the cases of cancer come too late for a radical operation. Hoffman in an analysis of 665 cases received in the Mikulicz clinic, found that the patients were referred to the surgeon on an average of 10.3 months after the beginning of the disease, and usually they were treated by the physician three months before surgical aid was sought. This should not be. Unless an early diagnosis be made, the result must be unsatisfactory. Take a middle-aged patient with good previous history, or history of old digestive derangements, who begins to complain of stomach trouble, which is not relieved by the usual remedies, an exploratory incision should be made, and if a suspicious growth be found, a radical operation should be done. A palpable tumor cannot be felt often where the growth has advanced to such an extent that a radical operation is impossible. Frequently when all of the enlarged hardened lymphatic glands cannot be removed, the operation should still be performed, since in many cases, these enlarged glands are not carcinomatous.

In careful hands the results are very good, and as a rule, the shock is not great. The general practitioner must realize the gravity of these cases, and the necessity of consulting a surgeon before the symptoms are so marked that the diagnosis

is evident. The successes of Kocher, Krönlein, von Mikulicz, Terrier, Hartmann, Robson, Mayo, Armstrong and many others, warrant, yes, I may say, demand an operation. When a small tumor is felt in a breast, the patient is almost invariably referred to a surgeon for advice, and why should a doubtful stomach case be left until a positive diagnosis be made?

There are some points in connection with surgery of the stomach, in which the surgeons are not in unison. It appears to me wise to excise an indurated ulcer, for in these cases, a small cicatrix as left by an excision will give less chance for the subsequent development of carcinoma. In one case operated on several years ago by the Y method, there was a return of the symptoms, with hemorrhage three years after the operation. The stomach was not enlarged, hence it may be deduced that the anastomotic opening remained sufficiently patent for its purpose. In a second case operated on for perforated gastric ulcer, the ulcer was inverted. About two years later this patient also had some return of his symptoms. In cases where I excised the ulcer, there has been no return of symptoms. Where a gastro-enterostomy is required in greatly debilitated patients, local anesthesia will, I believe, greatly increase the chances of recovery. Four of my cases of cancer were bed-ridden and were much emaciated, excision was impossible, a posterior gastro-enterostomy was done under cocaine infiltration. All recovered, and gained flesh.

Hemorrhage from the stomach occasionally occurs after appendicitis. This seems to indicate that toxins formed in the appendix reach the stomach, and cause glandular degeneration with perhaps the formation of an ulcer. Where there is catarrhal appendicitis, hyperchlorydria is frequently present, and thus, when an operation is being undertaken for gastric ulcer, the appendix should be examined if possible.

The treatment of diseases of the gall bladder is now on a firm basis, and as time goes on I feel sure that we will meet with fewer cases of common duct stones, for the cases will be operated on before the stones get into the common duct, though of course, there will be some cases where the stones form in the hepatic or common duct.

In cirrhosis of the liver the Thalma operation has been found of great value. In at least 50 per cent. of cases operated on, the symptoms are either entirely relieved, or markedly improved. With a mortality of 35 per cent., great judgment should be shown in the selection of the patients. If this be done, the death rate will undoubtedly be diminished. I be-

lieve it is wiser not to employ drainage, as the danger of infection is thereby lessened. Where it is necessary to excise portions of the liver for neoplasms, the hemorrhage is usually effectually checked by sutures of catgut carefully applied with large blunt needles. Only the largest vessels need be ligated. The liver heals quickly.

During the last year exception has been taken by many of the English surgeons to the removal of an apparently normal appendix during an abdominal operation, and I was amused to see opposite views expressed on this point by the Editors of the London *Lancet* and the Edinburgh *Medical Journal*. I agree with the Scott, and would be very much disappointed if a surgeon closed my abdomen without removing the appendix. That some of the Germans favor this view may be gathered from an article of Pankow's, who in referring to the work of Kronig's clinic, says: "Wir bei unseren Operationen die Appendektomie nicht nur für erlaubt, sondern auch für geboten halten." Of course the appendix is useful in cases of mucous and ulcerative colitis. When brought through the abdominal wall it provides an excellent means of irrigating the colon. I have used it also as a safety valve in a case of obstruction of the transverse colon due to a band where the cecum and ascending colon were tremendously distended.

A number of cases of chronic sigmoiditis causing symptoms of obstruction and closely resembling carcinoma, have been reported. Mayo considers his cases due to an acquired diverticulitis.

Last spring I operated on a case of acute obstruction due to an acute streptococcic infection of a segment of the sigmoid. An excision of the part with an end to end anastomosis six weeks later, gave a perfect result. This case is, as far as I can find, unique. There have been eight cases of phlegmonous enteritis reported, but none of phlegmonous colitis that I can find in the literature.

PARESIS—CERTAIN FEATURES IN REGARD TO ETIOLOGY AND DIFFERENTIAL DIAGNOSIS.*

BY JOHN G. FITZGERALD, M.B. (TOR.),
Clinical Director Toronto Asylum.

To Haslam, the Apothecary at Bedlam, must be given the credit of first bringing to the notice of the medical men of his time a clinical picture, which in the main coincides with that which we to-day speak of as dementia paralytica or paresis. In 1822 Bayle described, for the first time, the clinical symptoms in conjunction with the gross pathologic changes seen at the section table, and believed these latter were chiefly due to a chronic arachnitis and a chronic meningitis; this description was probably given because of the milky, cloudy appearance of the pia-arachnoid, also because both membranes are adherent, as a rule: the dura to the calvarium and the pia-arachnoid to the cortex-cerebri. The essential features, then, in the symptomatology and morbid anatomy were well described over eighty years ago. What advances have been made in regard to the nature of those factors which as an end result of their activity are responsible for the production of the disease condition? And how are we better able to differentiate the condition from others whose symptom-pictures closely simulate paresis?

In order to answer these questions I undertook a clinical study of cases at the present time in the Provincial Hospitals for the Insane in the Province of Ontario, and the facts which were obtained in this way form the basis of this paper.

Before proceeding to a critical analysis of the facts ascertained let me just briefly state how large the percentage of paresis is in the total of all cases admitted to hospitals and clinics for the insane. First, in a total of 331 admissions to the Taunton, Mass., State Hospital, for the year 1905-1906, there were 39 cases of paresis, or over 11 per cent. The admissions for 1906 to the Buffalo, New York, State Hospital: here the total admissions were 407, and of these 44 were cases of paresis, or over 10 per cent. In the Eastern Michigan Asylum for the last two hospital years the admissions were 853; of these 111 were patients suffering from paresis, or a percentage of over 13. And the admission record for the Toronto Hospital for the Insane up to August 20th of this year shows nearly 6 per cent. of all admissions to be cases of paresis; moreover, it is highly probable, at the close of the

*Read at meeting of Canadian Medical Association, Montreal, Sept. 11-14, 1907.

statistical year, that the percentage of paretic admissions will be even higher than at present. In clinics like the Bellevue psychopathic ward in New York city, I understand the percentage of cases in paresis is considerably higher than any that have been quoted, and one cannot help but be impressed with the fact of the alarming frequency of the occurrence of paresis, and if even 7 per cent. of all admissions to Canadian hospitals for the insane are cases of dementia paralytica the matter is worthy of our most serious consideration.

For many years certain factors have been looked upon as being of the utmost etiologic importance in the causation of paresis, and every alienist who has a text-book on psychiatry to his credit gives a list of supposed causes, many of which because of their venerability alone merit any attention; others, however, are doubtless worthy of consideration, and it is with these that I wish to deal shortly.

Kraepelin, whose views at the present time are widely recognized by students, both here and abroad, believes paresis to be a disease of auto-intoxication, in which the toxins are the result of faulty metabolism, the cause of which is often, but not always, syphilis. When the syphilitic condition is once established the disease (paresis) progresses automatically. It is a well known fact that anti-syphilitic treatment is absolutely valueless in paresis, and this in itself lends support to Kraepelin's view, which is really a middle one between some French observers, on the one side—many of whom go as far as to say that paresis is a para-syphilitic condition—and certain of the Germans, who hold that syphilis is not necessary for the production of the disease.

Krafft-Ebing, a few years before his death, created something of a sensation by announcing that a certain physician had inoculated nine paretics, who were in the last stage of the disease, in whom no specific history had been ascertained, and in not one instance did an indurated chancre develop. Despite the fact of the convincing nature of this testimony no other investigator to date has had the courage to continue the work along similar lines.

Unfortunately nearly all studies relating to the causative factors in paresis have been in the nature of clinical enquiries, and a very small amount of laboratory investigation has gone hand in hand with the clinical work. However, a number of Scotch observers, headed by W. Ford Robertson, have for some time been impressed with the view that the toxemic theory was the most probable one, and set about to discover, if possible, the agent whose activities induced this toxemic condition.

In various contributions to the literature these authors have announced their results, which were summed up by Robertson in the Morrison Lectures, delivered in the Royal College of Physicians, Edinburgh, in January, 1906. In this lecture it was announced that dementia paralytica was as specific in its causation as diphtheria, Robertson holding that the syphilitic infection only weakened the resistive power of the organism, and that the specific etiologic factor was a diphtheroid organism, differing from the Klebs-Loeffler bacillus only in being less virulent, and was to be regarded as an attenuated form of this micro-organism.

This organism, according to Robertson, has been found in the brain in nine cases in a series of twenty-three in which cultures were made; it had also been observed in preparation of fresh blood and cerebro-spinal fluid, also in the walls of cerebral blood vessels.

The work of Robertson, Bruce and McRae has been duplicated by only one other investigator, whose work was largely confined to the isolation of a diphtheroid bacillus in the stomach-washings and urine of a number of living paretics, and in these cases the micro-organism was also found in the nose and throat.

The work of Robertson and his associates has been largely discredited by the findings of other British investigators, Eyre and Flashman, working at Colney Hatch and Claybury, found in an analysis of 60 paretics and 78 cases of various other psychoses, that only 16.6 per cent. of the cases of paresis showed the presence of diphtheroid bacilli in swabs from the nasal and pharyngeal mucosæ, while 17.9 per cent. of cases not suffering from paresis showed the same micro-organism. In other words, the bacillus which Robertson believes to be the specific agent in the causation of paresis is found more commonly in the patients who are not paretics. Mott and others have also failed to substantiate the findings of Robertson; so we must conclude that the diphtheroid bacillus does not cause paresis, and that if the chief factor in the causation is a micro-organism it has not as yet been found.

The work of Wasserman, Plaut and Schültze on the serum of paretics is also very interesting in regard to the part played by syphilis in the etiology in forty cases of paresis. Where syphilitic anti-bodies were tested for by hemolysis they were found to exist in thirty-one cases, to be absent in five, and in four the reaction was not certain. Here, then, were five cases of paresis in whom it is possible no antecedent syphilis

existed. Marinesco and others have also failed to find the pale spirochetes in paretics examined at different stages of the disease.

In this series sixteen cases in twenty-four had positively had syphilis; three others were treated for some venereal disease, but it is uncertain whether the trouble was specific; of the remaining five, two denied positively any history of infection, but were discharged soldiers and scars were found on the glans. The other three cases are uncertain, but should not be classed as negative. So in this series at least $66\frac{2}{3}$ per cent. can be included as definitely having had syphilis. In one of the cases, a woman patient, her husband had suffered from syphilis and died in Toronto Asylum from an alcoholic psychosis, but did not have paresis, while his wife, who doubtless was infected by him, was not alcoholic, nevertheless is suffering from paresis.

An alcoholic history was obtained in fourteen cases of the twenty-four, approximately 60 per cent. Alcoholic excess was marked in about 75 per cent. of these positive cases, and in the others it varied from occasional spreeing to a moderate alcoholic history, extending over a limited period.

Twenty-two of the twenty-four cases were in males, two in females. That paresis occurs much more commonly in men than in women is a well known fact, and the very high percentage of males is not unusual. In looking over the admissions of certain American institutions I find about 12-14 per cent. females. In only three of the cases was the onset after fifty years of age. Twenty-one patients developed the disease before they had reached forty-five, and eleven of these were under forty. The earliest age of development was twenty-seven and the latest fifty-five.

Fifteen cases were married and nine single. Of the fourteen who were married one woman had had one healthy child, the other had had no children but had one miscarriage; in her case a positive history of syphilis had been ascertained. The wives of seven other cases who were married had borne healthy children; the wives of the remaining five had no children, and one of them had two miscarriages. In some of the cases in whom a definite history of syphilis had been obtained the wives had children; in others, in whom no history was elicited, there had been no children, so it was impossible to make any deductions.

The occupations are of no special interest, as men in all walks of life are included in the series, but the regular army furnished a larger quota than any other calling. One of these

soldiers denied syphilis positively, but gave a history of enteric fever in South Africa. Another of the series had also suffered from the same trouble, and a third case, at present in Toronto, had enteric fever; this last patient is suffering from another psychosis. In none of these cases was there any family taint, as far as could be learned. I would like to suggest, therefore, that possibly enteric fever, bringing about exhaustion, may be a predisposing factor in the etiology of this condition.

In regard to a previous history of nervous instability in the family, in eight of the twenty-four cases there was a definite family history of a psychosis; in two instances the insane relative was of the same generation.

Of various other assigned causes, in one case there was a definite history of head injury, and the symptoms developed, or at least were observed, after that. In this instance it is noteworthy that from all the evidence it is almost certain that the accident was independent of the paresis and not the result of an apoplectiform seizure. This patient, however, was able to continue his trip the day of the accident, and it was only after certain other symptoms appeared that the accident was regarded as being the chief etiologic factor. Further, it is significant that in every case in which a cause is assigned, whether it be worry, shock or overwork, a positive history of syphilis was obtained.

From the standpoint of the clinician it seems almost impossible to dissociate dementia paralytica and syphilis when one considers the question of etiology, but to be honest, we who are engaged in the special practice of psychiatry must acknowledge that there are cases in which no history of specific infection was ascertained and other cases where no evidences of a previous syphilis were found. That paresis is a para-syphilitic condition cannot at the present moment be taken as conclusively proven. It is to be hoped that pathological chemistry will come to the rescue in the very near future and aid psychiatry in solving one of its most difficult problems.

Passing on, then, from a consideration of etiologic factors to a brief review of some points in the differential diagnosis, let us first consider for a moment the nature of certain of the prodromata and the variations in the length of the prodromal period as ascertained from the histories. It is hardly necessary to emphasize the fact that it is almost impossible to get an absolutely trustworthy account of when the psychosis first showed evidences of its presence. In very many cases the onset of the illness is dated back only to the time when the

patient is no longer able to continue his work, while it often happens that patients have shown some change in the character of their work very much earlier. In three of my cases the onset dated back to four years before admission, although the diagnosis in none of these cases had been made for at least two or three years after the time when the patient had shown definite changes in character, etc. Five cases had a prodromal period extending over two years. Six cases gave a history of mental disturbance dating back from six months to a year and a half. The remaining ten cases were not observed until one to three months before admission. Eight of the ten cases, or one-third of all the cases, became suddenly and violently insane and were arrested, and in practically all of these the patients were working up until within a few days of their arrest. It is unfortunate, but it is nevertheless true, that in a great many instances the only criterion of the patient's mental state is his ability or inability to maintain himself in his particular sphere; in other words, he may show many signs of mental derangement, but just so long as he is capable of continuing at his work and earning his livelihood his status is not questioned, unless he is so unfortunate as to come into sudden and violent conflict with his environment, as eight cases in this series did.

I wish, then, to emphasize the fact that a very large percentage of the cases of paresis may, in their method of onset, simulate cases of acute maniacal excitement, of a functional character, and that the practitioner must ever be on his guard lest he give a favorable prognosis in a condition that invariably ends fatally. All of these eight cases showed greatly increased psychomotor discharge, emotional exaltation, and a suggestion of flight of ideas, so it will be evident how difficult it would be to make the diagnosis of paresis; but I believe in every case of a psychosis developing suddenly, with acute excitement, in men between the ages of thirty-five and forty-five, paresis should be thought of and positively excluded before any diagnosis is made.

It is beyond the limits of this paper to categorically give the differential diagnosis of paresis and all other conditions that may simulate it, but certain of the psychoses, a short list of which I may here enumerate, may be excluded by one simple measure—lumbar puncture. The conditions that may in this way be ruled out are: Maniaco-depressive psychosis and allied states; dementia-præcox; all the alcoholic psychoses; arterio-sclerotic psychoses; epilepsy; paranoia and all paranoid states; and lastly, the psychoneuroses and neuroses,

and this is of extreme importance because of the frequency with which paresis and neurasthenia are confused in their early stages.

The value of the findings of lumbar puncture cannot be too strongly commended, and it is of even greater significance that a negative lumbar puncture is of more value than a positive if it is done three times, at intervals of at least ten days, and each time found to be negative. In paresis the almost invariable rule is that there is a spinal leucocytosis and an increased proteid content found on examination of the cerebro-spinal fluid, whereas in all the other so-called functional psychoses already enumerated these findings are absent unless the patient is syphilitic, when there may be a spinal leucocytosis; under these circumstances, however, we are not dealing with a pure functional psychosis, but with one which is complicated by the presence of a syphilitic or para-syphilitic process. Here, of course, various other clinical signs would aid in solving the problem, but I wish to repeat that if a negative puncture is obtained on three occasions, at least ten days apart, we can positively exclude paresis. I have only been able to do lumbar puncture in seven of my cases, as some of the patients were in other Ontario institutions; in the seven, however, a spinal leucocytosis was demonstrated in every case, the total count running from seventeen in the lowest to over one hundred in the highest, and averaging at least fifty to the c.m.m., and five cells to the c.m.m. has been made the normal limit, although some other workers claim to have found a higher count in normal cases; such has not been my experience, either in Toronto or Baltimore.

It is not necessary to detail at any length the findings in differential counts, but it is sufficient to state that the mononuclear elements are usually in excess of the polynuclears and that plasma cells are often found.

In concluding this paper I wish to again draw your attention for a moment to the differential diagnosis of pure paresis and alcoholic-pseudo paresis, where lumbar puncture findings are of the utmost value, and it is to be remembered that the positive count and increased proteid-content have both been obtained in cases of paresis where lues was definitely negative. In the alcoholic-pseudo paresis uncomplicated by syphilis, on the other hand, a positive result is never obtained. No single sign is present so early, and is of such extreme significance as spinal leucocytosis and an increased proteid content, and in every doubtful case the procedure should be the final court of appeal.

THE NECESSITY FOR FURTHER LEGISLATION REGARDING TUBERCULOSIS IN ONTARIO.

By Dr. W. J. ROBINSON, GUELPH, ONT.

More than a quarter of a century has elapsed since Koch first announced to a skeptical world the real cause of consumption, and an important question for consideration to-day is whether the progress made in the cure and prevention of this disease is as great as might be expected so many years after such an important discovery. It does not require a very observant mind to arrive at the conclusion that in this Province, at all events, practically nothing has yet been done to check the progress of consumption. This statement may seem extreme, but we have only to refer to the death records of this disease since 1871 to convince the most optimistic that there is no halt in the onward march of the foe. In 1871 there were 1,049 deaths in Ontario from consumption. In 1904 there were 2,877 deaths from the same cause, an increase of 175 per cent., while the population of the Province increased during the same period only about 35 per cent. There was practically a regular annual increase in the disease up to the year 1900, when the sum total of deaths reached 3,484. For two years after this period there was a rapid decline to 2,694 deaths, but the scale seems to have turned again, and the death rate is now showing a steady annual increase.

It is a well known fact by those who have anything to do with mortality records that there is an increasing tendency to give the cause of death as anything else but consumption, and there is very little doubt but that the mortality rate of bronchitis and pneumonia is unduly swelled by the addition of many cases which should be registered as consumption. The official figures, if they err at all, err on the side of minimizing the number of deaths. In every other infectious disease there has been a steady yearly decline in the death-rate, not only in Ontario but throughout the world, due to a very large extent to the legislative measures which have been enacted regarding these diseases. It is surely time for boards of health, for municipal authorities, and for the Legislative Assembly to wake up, and take a deeper interest, not so much perhaps in the cure as in the prevention of this disease.

So far as I know the only special legislation on our statute books regarding tuberculosis is an Act passed in the year 1900, "Respecting Municipal Sanatoriums for Consumptives." This

Act, at the time it was passed, was characterized by the then Secretary of the Provincial Board of Health, Dr. Bryce, "As a bill which in its comprehensive character exceeds any legislation known in any country for dealing systematically with tuberculosis." This bill, from which great results were apparently expected, has thus far proved a dead failure, as I believe with one exception no municipality has ever taken advantage of its provisions or showed any serious inclination to do so. A few years ago voluntary associations for the prevention of tuberculosis were organized in many towns and cities throughout the Province. Much was expected from these societies, but after languishing in a state betwixt life and death for a few years they also passed away. We have in our Public Health Act a means by which local boards of health can deal with the question of tuberculosis in a similar manner to any other infectious disease. This provision in the Act has also been a dead letter, as I do not think any local board in the Province, with one exception, has tried to secure even voluntary notification. Probably it is just as well that local boards have not dealt with this question, as the nature of the disease is in many respects so essentially different from the ordinary infectious diseases that something more than mere local action is required.

By consulting the death reports each year we see how vain has been every effort or want of effort in the past. The number of deaths is greater year by year, and all the little work that has been done seems to touch the mere fringe of the question. The inefficiency of our present system, or lack of system, and the necessity for more advanced regulations, no doubt suggested a bill which was introduced into the Legislative Assembly last March, by Mr. Downey, and which contains the germ of what should prove most useful legislation. The essential feature of this proposed bill is compulsory notification. Without this provision as a starting point all legislation will be in vain, and we might as well leave the whole question in the future, as in the past, to private efforts. Compulsory notification, if properly enforced, would in a short time give us a complete census of the disease in this Province, and would bring every case into touch with any central authority that might be desired.

Another feature of the bill is that County Boards of Health should be established in every County of the Province for the purpose of dealing exclusively with questions of tuberculosis in each county. If any great good is to be derived from com-

pulsory notification some new body must be established, and probably a County Board of Health, or a County Association for the Prevention of Tuberculosis, or whatever other name might be thought suitable, will answer the purpose as well or better than any other.

This board in its ordinary routine work must not be too expensive, in fact a few hundred dollars a year for each county should pay the ordinary expenses. *It must chiefly exist as a cog in the wheel of the machinery by which a great crusade against tuberculosis can be made to reach every corner of the Province.* If compulsory notification be conceded, this notification must be made, either to the present local boards of health, direct to the Provincial Board, or to a new body to be established. Local boards of health as a rule throughout the province are in a semi-comatose condition, and reports of cases of consumption to them in nine cases out of ten would be wasted energy. The Provincial Board at Toronto is too far away from the greater part of the Province, and could not, unless at very great expense, maintain more than a mere perfunctory supervision over the cases.

Under the provisions of Mr. Downey's bill the county board would be composed of one member from each local board of health, the County Clerk and the Warden of the County. Possibly a better method of appointing such a board might be devised, but as this keeps the local and county health boards in touch it seems a very good proposal. Probably for the present this board should not be endowed with any compulsory powers, except to enforce registration, and its chief function should be to arouse public interest, to excite enthusiasm and to become a vehicle by which information regarding the disease can be made to reach every home in the Province. One of the educational features of such a board would be the annual meeting, to be held at the county town, which would naturally resolve itself into an antituberculosis meeting, and which could be addressed by sanitariums, and others having scientific and practical knowledge of the subject. Another feature which might properly be added to the bill would be annual meetings of delegates from the various county boards, at say, London, Hamilton, Toronto, Kingston and Ottawa, for their respective sections. The Provincial Government should defray all expenses of these meetings and should provide the most eminent sanitariums obtainable to address them.

What comes after registration? is a question which is often asked. It seems pretty clear that a system of dispensaries,

which have proved so successful in Europe and in some of the large cities of the United States, would be of little benefit in our Province, and would not be practicable except in a few of the larger cities. A system of regular visits to all reported cases of consumption by a specially trained and qualified nurse, employed by the county board with a liberal grant from the Government towards the expense, would do an immense amount of good. No doubt in time sanatoriums would be erected by counties or groups of counties, especially for the care of incurable or indigent patients. The rapidity with which these will be built will depend greatly on the liberality of the Government, which should increase its present grant of one dollar and fifty cents a week to at least three dollars for each patient. No matter how generous the Government may be, no matter how enthusiastic the county board may be, no matter how many sanatoriums may be built, the great mass of consumptives will continue to live and die in their own homes, and any legislation to achieve success must provide means of reaching these homes.

It has been estimated by competent authorities that for each death from tuberculosis there are at least ten cases of the disease in the community. On this basis we must have in the Province of Ontario to-day about thirty thousand people suffering from tuberculosis in some form. When we think of the tremendous economic loss resulting from even the partial incapacity of this great army we are justified in urging upon the Government any reasonable expense having for its object the curtailment of the disease.

From our present knowledge we must come to the conclusion that tuberculosis is more easily prevented than any other infectious disease. In the vast majority of cases the contagion exists only in the sputa, and with proper care of this one excretion of the body I have no doubt in ten years the mortality record of the disease will be cut in to.

We require a body of enthusiastic and intelligent men scattered throughout the Province, adequately supported by the Government, to enter into this great fight. I believe that a bill such as that introduced by Mr. Downey, with perhaps some modifications of details, will succeed in enlisting such a body of men, and that though the fight may be long, and many difficulties will have to be overcome, success will eventually crown their efforts, and tuberculosis will be all but banished from the land.

A CASE OF PRIMARY BILATERAL MASTOIDITIS.*

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The clinical history of the case which I present to you at this meeting would, I think, be of sufficient interest to report, if the title had been simply one of bilateral mastoiditis. Such cases are quite uncommon, but in this instance it has associated with it features which suggest the use of the word *primary*.

I am well aware that primary mastoiditis is exceedingly rare, if one reports a case wherein there was not and never had been any infection of the middle ear. Infection may travel through the eustachian tube into the tympanum, and from there to the mastoid antrum. The resisting power of the mucous membrane of the tympanum may be sufficient to prevent any appreciable symptoms, and a mild reaction pass unnoticed, while the infection leads to pus formation and necrosis in the pneumatic spaces of the mastoid. If I may be permitted to use the word primary to denote those cases where suppuration exists in the mastoid without, not only aural discharge, but any symptoms denoting involvement of the tympanic cavity, then my title will hold good. One must not forget that cases of chronic middle ear suppuration occur in which no discharge appears externally, and furthermore cases long since healed may during such diseases as scarlatina, measles, diphtheria, typhoid, tuberculosis, syphilis and other systemic diseases have conditions associated with them which favor mastoid suppuration. I cannot do better than quote Blake-Reik on the surgical pathology and treatment of diseases of the ear: "A careful study of the few cases of reported primary mastoid inflammation on record suggests, in the light of more recent experience in this field of clinical investigation, the suspicion that there had been previous middle ear inflammation as the inceptor of a chronic quiescent mastoid disease, which was later awakened by acute manifestations, while in others the implication of the mastoid cells possibly followed a superficial periostitis on the outer mastoid surface with pus formation, denudation of bone and subsequent spontaneous perforation inward."

Lady, age 61, seen in consultation with Dr. C. P. Lusk. Family and personal history unimportant.

On the 4th of October was taken ill with what appeared to be a mild attack of influenzal grippe, with a temperature of

* Read at meeting of Canadian Medical Association, Montreal, 1907.

101 1-2—102, cough, aches and pains over body, and mild catarrh of the bronchi. One week later she was taken with a chill and a pronounced rise in temperature to 104 degrees, depression marked and all the symptoms of a return of the catarrhal cold from which she had been suffering. It was considered a re-infection. The temperature dropped the following day to 99, pulse 86, respirations 20. The condition remained unchanged for the next four or five days when she complained of a good deal of pain in the head especially on the vertex and along the course of the posterior auricular nerve. There was no pain or pressure on the mastoid whatever, and no aural discharge. Both membranes were quite normal and hearing not impaired. The external auditory canal along the posterior wall of the cartilaginous portion was quite tender. Four days later the pain in the vertex, while persisting to some extent, was associated with some tenderness over the mastoid, but was not different from the left mastoid which had given no evidences of mischief. The patient was in a very nervous condition and it was difficult to say really how much pain she suffered, and as the other side was also tender, one naturally did not feel like relying too much on the patient's replies. The next day both walls of the external auditory canals were found considerably swollen, making an inspection of the deeper structures very difficult.

I now saw the patient and was able to elicit slight mastoid tenderness, localized over the right mastoid antrum, some very indefinite tenderness over the left mastoid. Both meati were found much occluded by swelling, but I was able to see the drum and found nothing to record. Next day a very little pus was found in the external ear, but it came from the posterior wall of the canal, and not from the tympanum. There was no perforation whistle on inflation. Temperature 99, pulse 72, respiration 20. The case was one really wherein one was asked to exclude the ear as being the cause of the frequent rise of temperature, and the cause of so much depression and pain on the vertex. The absence of aural discharge and the absence of any symptoms of tympanic involvement made the question a difficult one. The condition of the patient was one of great concern, while the temperature did not go higher than 100 and pulse 85, the depression was very marked and increasing. It was then decided that the right mastoid should be opened. At the time of operation it was, so far as we could learn by aural examination or percussion or from the patient's symptoms, immaterial upon which side the operation was performed. As the right had previously been the severe one it was taken.

You will, therefore, see that the operation was in not a few respects an exploratory one, and it was of little choice which side was operated. The right mastoid as being the worst if any was then laid bare by the usual post aurial incision. On chiseling into the bone over the antrum creamy pus was found at a very short distance. The opening was enlarged and the mastoid was found to be of the diploëic type, and while there was not much breaking down of the intercellular walls there was most extensive involvement of the cells. The point of great interest was noticed that the disease seemed to extend, as it were, through solid walls of bone infecting cells well beyond areas of hard smooth bone. The tip cells were extensively diseased, and no connection could be made out between this area and the antrum. The same condition existed in the cells at the root of the zygoma. Owing to finding pus beyond areas of apparently healthy bone I considered it best to lay bare the lateral sinus, as one had no way of knowing where the outside area of the infection extended. On removing the hard and healthy looking boundary of the sinus I found a collection of creamy puss over the vein—an extra dural abscess. The venous walls appeared healthy and there was no thrombosis of the sinus.

Owing to having found such an extensive suppurating focus with so little subjective symptoms, I decided to open the other mastoid, and this was immediately done, when an exactly similar condition was found with the exception of the extra dural abscess; the sinus was exposed, but no pus was found.

The antra lay very high on both sides, that on the left being one inch above the superior border of the external auditory canal, and the right one half an inch above. It was particularly noticed the presence of large cells along the post wall of the bony meatus, which were extensively diseased and communicated with the ear canal. This accounts for the discharge in the ear canal the day previous to both operations. The additus and tympanum were left alone as there was no evidence of any disease there.

The pus was found to be of pure pneumococcus origin. The healing of the cavity was rapid and uneventful. Beyond an excessive pale, straw colored serous discharge containing pneumococci in pure cultures, which persisted for about a week or ten days, there was nothing to record. Dry dressings changed twice a week were sufficient. The patient regained strength somewhat slowly, and is now quite well with almost normal hearing.

84 Carlton Street, Toronto.

UNUSUAL TYPE OF TOXEMIA OF PREGNANCY.

By T. S. FARNCOMB, M.D., M.R.C.S. ENG., L.R.C.P. LOND.

About one o'clock in the morning of July 5th I was called hurriedly to see Mrs. J. H., a primipara seven months pregnant, but whom I had never seen before. The husband, who called me, stated that his wife retired about eleven o'clock apparently in her usual health, but woke him at twelve saying that she could not breathe. When I reached the house I found her in a state of collapse. The whole body was absolutely cold and covered with a profuse, cold perspiration; the pulse was barely perceptible, but as nearly as I could count it it was in the neighborhood of 180. The lips and finger-nails were deeply cyanosed, the rest of the body being a dead white. There were loud bronchial rales at each breath and a large quantity of sticky mucus running out of the mouth. She had to be kept in the sitting posture as she became smothered if the head were lowered. I immediately sent for Dr. Kidd in consultation. We stayed with her nearly the whole day, with difficulty keeping her alive, giving strychnia and digitalin, injecting saline solution in both breasts, keeping her surrounded with hot water bottles, etc. Also gave her atropia, which gave great relief in lessening the secretion of mucus in the bronchial tubes. About an hour after I first saw her we obtained a specimen of urine, which turned absolutely solid on boiling.

July 6th.—Patient slightly improved; pulse about 120; breathing easier, but had to be supported in the sitting posture in bed. Scarcely secreting any urine.

July 7th.—About same, except pulse about 100 and better character; very little urine.

About four a.m. of the 8th patient miscarried, the fetus evidently having been dead three or four days, probably the night she was taken ill.

On the 10th she had a very free attack of epistaxis, lasting three or four hours, and requiring the plugging of the nostrils to check it. After this she made a slow but uneventful recovery, the urine being free from albumen in about a week from the beginning of the attack. The peculiarity of the case was that there were absolutely no head symptoms; the patient complained of no headache nor even dizziness and no disturbance of vision. There was very little edema and not the slightest tendency to convulsions. Her condition was just what one would expect after a profuse hemorrhage, but very different from what I, at least, have usually seen in uremic poisoning.

Trenton, August 5th, 1907.

Editorials.

BRITISH MEDICAL ASSOCIATION.

We have much pleasure in publishing in this issue a letter from a physician of Toronto, who attended the Exeter meeting, as we are especially glad at the present time "to hear from the other side." It is only fair to add that at least two other physicians of Toronto were well pleased with the treatment they received from the local committee. It would appear that this committee was desirous of extending courtesies to all strangers from Canada. For instance, the following means much: "I am a member of the committee, and I have not been able to find anyone yet to make myself useful to; will you join us?" There was evidently a lack of system, which perhaps accounted to a large extent for the serious mistakes which were made.

We are still of the opinion that the Council of the Association should see that no such mistakes recur. The simple facts remain. Some of the most prominent members of our profession in Canada were absolutely ignored at the last meeting. We hope, and believe, that such treatment of distinguished visiting physicians from Great Britain will never be known in "colonial" Canada.

THE GENERAL HOSPITAL.

A very important meeting of the Board and Teaching Staff of the Toronto General Hospital was held October 10th, in the building of the Medical Faculty. Among those present were: President Falconer, of the University; Mr. Flavelle, Chairman of the Board; His Worship Mayor Coatsworth; Messrs. Walker and W. T. White, and Drs. Orr and Macallum, a committee representing the Hospital Board; Dr. Brown, Secretary of the Board; Rev. Bruce Macdonald, representing the Committee on Hospital Relations from the Board of Governors, and 38 members of the Hospital Staff, who are also members of the Medical Faculty.

The Chairman of the Hospital Board said that his Committee was charged with a duty of reporting to the Board of the Toronto General Hospital a plan of reorganization of the Staff. The committee had been in existence for 12 months, and much work had been done during last winter, but instead of reporting in the Spring, the members decided to wait until the appointment of a permanent President had been made.

He asked those present to give their opinions as to the various aspects of the subject.

A long and interesting discussion followed. The members of the faculty had evidently studied the subject in all its phases very carefully, and spoke with ability, and an earnestness that was quite impressive. The differences between the opinions expressed were much less than one would have expected. The Chairman showed that he possessed a marvellous grasp of the whole subject in both the scientific and practical aspects down even to small details. The President showed a wide knowledge as to the educational conditions in Germany, Great Britain, the United States and Canada. Among the other members of the Hospital Board who have also carefully studied the subject were Messrs. White and Walker and Doctors Macallum and Orr. We hope to speak in greater detail respecting this important meeting in a future issue.

DOCTORS FALCONER AND HUTTON.

We had intended to make some editorial comment as to the out-going of our temporary and the incoming of our permanent President. While thinking on this subject we had the good fortune to see the *Varsity*, of October 10th, which contained an editorial so exactly in accord with our ideas that we take much pleasure in reproducing it in its entirety.

It is very satisfactory that the organ of the great student body should pay such a tribute to Dr. Hutton and Dr. Falconer.

“It would be pleasant to be able to put into words the universal spirit of congratulation that has prevailed since the opening of the college year, as the University has begun to get

acquainted with President Falconer. So high are the responsibilities that now attach to the office of President of the University of Toronto, and so great the opportunities for useful service, that, for a year, the University world almost held its breath lest the deliberations of the Governors should be disturbed. When the announcement of the selection of Dr. Falconer as President was made, all who knew him were delighted. As Toronto heard more about him the satisfaction grew, and since he has come among us the University is well content. It is safe to say that not for a long time has such a spirit of unanimity prevailed in the University as has been evident since the new Act went into force and since President Falconer has taken up his work. The expression that the University is entering upon a new era is heard everywhere, and it is one that seems to be fully justified. Only public sympathy with the work carried on in Toronto can justify the increasing expenditure, for the financial needs of the University are bound to increase with every year. That sympathy we are well assured of with a man like President Falconer to represent the University before the public.

The long delay in the selection of a President was well justified when it resulted as it did, particularly because, during the interregnum, Principal Hutton was at the head of the University. In his year of temporary office he became better known to the University at large, which is to say that he became even more than ever esteemed. University College had to give up her pleasing sense of proprietorship in Principal Hutton for a time, but the pride she took in the way the duties of his office were discharged compensated her. The Principal was probably right in his view that he could best serve the University in his present office, but he might derive some satisfaction at least from the hopes that were continually expressed that he might be permanently made President. They came, in part, of course, from his own college, but they also came from every faculty and college in the University. They came, too, from a source which, to put it mildly, the Principal has never stooped to flatter, the Press. It is a happy outcome that gives us both a Hutton and a Falconer."

CONTAMINATED MILK.

Toronto has always prided herself on the purity of the milk supply, and the feeling has become so pronounced that, on the strength of it the dealers are raising the price to nine cents a quart. It comes as a shock, therefore, to those of us who had faith in the Queen City, to learn that an analysis of various specimens of milk obtained in different districts showed a condition of affairs that is simply appalling.

Boston gives a certificate to any milk the bacterial content of which is less than 10,000 per c.c. Out of a large number of samples in Toronto the lowest count was 500,000—fifty times more than the Boston standard for good milk! And this was the very best the city could produce! Other specimens went up to the billions per cubic centimetre. Is it any wonder that the infant mortality increases with a jump in the hot weather, when we are pouring down the throats of our little patients pure cultures of pathogenic bacteria? Of what avail are careful computations of milk mixtures when we have only such stuff as this for food?

The City Board of Health deserve great credit for the way in which they inspect the dairies and the milk delivery, but the inoculation takes place before the cans leave the farm, and the surveillance in the city is only locking the stable after the horse is gone. Unless the inspection extends to the stables and the fields it can be of little avail. We sincerely hope that every physician will use his best effort to have the matter brought under proper control, and thus remove a burning disgrace.

HONORS TO DR. BRAY.

Dr. Bray, the Council's new Registrar, went to Chatham the second week in October, to say good-bye to his numerous friends in that city.

The sisters and nurses of St. Joseph's Hospital, assembled October 7th to wish Dr. Bray godspeed, and presented him with a handsome illuminated address offering on behalf of the

Mother Superior, sisters and nurses, their congratulations on his recent appointment, and also expressing their appreciation of the noble work which he had done in their hospital for many years. They also presented him with a handsome suit-case and Mrs. Bray with a beautiful clock.

The physicians of Chatham entertained Dr. Bray at a banquet on the evening of October 8th, and presented him with an illuminated address. In giving expression to their feelings of friendship they referred to the fact that he had filled many important positions, both in the profession and in public life. They offered their congratulations on his recent appointment, and heartily joined in wishing for the Doctor and Mrs. Bray many happy and prosperous years in their new home.

THE CANNING INDUSTRY.

There was a time years ago when the canning of fruit and vegetables was a product of the home. That time has almost passed, and the preparation of these articles of food has passed into the hands of extensive factories. Keen competition has cut the profits, and overlapping factories have stimulated a combination with the idea of increasing profits, decreasing expenses and if necessary limiting production. If this combination would go a step further and make the sanitary arrangements of these factories perfect, then no one could find fault with the three objects enumerated, but sanitation appears to be, except in a very small minority of cases, entirely overlooked.

If we read carefully the report made by Dr. Bell to the Provincial Board of Health, No. 36 in the *Sanitary Journal*, it will at once strike us that some stringent law must be passed that will at once and forever prevent the continuance of these very unsanitary conditions. We quote from page 213, which is about one-quarter of the report, an excerpt that is undoubtedly bad reading: "Frequently there is insufficient table accommodation, if any at all, and I saw in different places women and children sitting on the floor or sides of the bed

eating their food, which was kept in dirty fruit baskets under the bed. Many of these buildings were dirty, apparently never swept, while scrubbing was not thought of, neither scrubbing dish, mop or broom being about the place. Sometimes one tin wash-basin was available for eighteen to twenty people. The few dishes used by these people are rarely washed. Waste food lies on the beds, where meals are hastily devoured, and flies are in swarms. In one case I saw fourteen double straw mattresses on two rough board platforms for twenty-eight people in one compartment. Adjoining this, in an old ramshackle building, badly lighted and ventilated, and opening into the dark end of a shed, were five upper and lower berths on each side of a narrow passage, the room being about 35 x 14 x 7, for forty people, both these places being filthy, and choice places for breeding vermin. Neither wash-tub, broom or wash-basin was about the place, and on making inquiries as to washing accommodation, I was pointed to a water closet across the yard, in the corner of which was a small iron sink, and here all these people were supposed to perform their ablutions. Do you suppose for one instant that they were performed? I admit there was a notice in the factory to the effect that after visiting the closet hands must be washed. There was neither soap nor towel to be seen, and if hands were washed they were dried on the dirty apron or dress. How can these people be clean under such circumstances? Yet these are the persons who are employed to handle and put up our choicest foods."

To correct this evil it will be necessary for the Government to pass a law placing all canning factories under the control of a department that will have full power to see that all regulations are faithfully carried out. There must be sufficient wash-room space, sanitary water closets and sleeping accommodation away from the factory, where they house their employees. During the canning season an inspector should visit each factory not less frequently than once a week, and have power to enforce the law. It would be well also to have an inspection of the fruit, because over-ripe fruit is often

used, which may be a fruitful source of disease. It is better to prevent the turning out of a bad product than it is to confiscate it after grave injury to health has been produced. Furthermore, it would be a great safeguard to the purchasing public, and a surety of cleanliness in production, to have each can bear the stamp of Government inspection.

NOTES.

The largest Public School in Toronto, recently built on the site of the old Phœbe Street School, will accommodate nearly 1,500 children. It has been named the Ogden School by the Board of Education in recognition of the long and valued services of Dr. W. W. Ogden, who has served as Trustee for forty-three years.

Dr. C. A. Hodgetts, Secretary of the Provincial Board of Health, and Dr. John A. Amyot, Provincial Analyst, attended the meeting of the Public Health Association at Atlantic City, October 8, 9. They also visited the cities of Philadelphia and Albany, where they inspected water filtration systems. Of the 300 delegates at Atlantic City, there were fifteen from Canada, twelve from Mexico, and two from Cuba. Dr. Hodgetts was elected 2nd Vice-President. The next meeting will be held in Winnipeg.

Ontario Medical Council.

An emergency meeting of the Ontario Medical Council was held in Toronto, October 4th, to consider the report of the Building and Site Committee.

It was decided that the present building situated on the property on University Avenue, recently purchased, should be fitted for the ordinary meetings of the Council and other executive purposes. After considerable discussion it was decided that the building of an examination hall should be left for further consideration at a future time, and that in the meantime a hall or halls for examination purposes should be

secured from the University of Toronto or elsewhere in Toronto.

We understand that many members of the Council entertained a very strong opinion that a great body like the College of Physicians and Surgeons of Ontario, the medical parliament of the Province, should own its own examination hall.

American Association of Obstetricians and Gynecologists.

When an association of medical men, organized for the scientific study of special topics, reaches its twentieth year its work becomes a fit subject for comment, if not criticism. The association in question held its initial meeting at Buffalo, April 19, 1888, and its first annual meeting at Washington, September 18, 19, and 20, the same year. Fifteen men were present at the initial meeting, who were supported by the cooperation of fourteen others, and by the time of the first annual meeting these had increased to a total of forty, who became foundation members.

Its twentieth annual meeting was held at Detroit, September 17-19, 1907, under the presidency of Professor Robert Tuttle Morris, of New York, and it is no exaggeration to state that it was one of the most interesting, instructive and useful meetings the association has ever held. The papers dealt with live questions, the debates were crisp and aggressive and the entire atmosphere was full of progressive thought.

The twenty-first annual meeting will be held at Baltimore, Tuesday, Wednesday and Thursday, September 22, 23, and 24, 1908, under the presidency of Dr. E. Gustav Zinke, of Cincinnati. The newly elected president is a man of broad culture and a student of the most important and difficult problems connected with his specialty.

The other officers elected were: First vice-president, John W. Keefe, Providence; second vice-president, W. A. B. Sellman, Baltimore; secretary, William Warren Potter, Buffalo, treasurer, Xavier Oswald Werder, Pittsburg.—*Buffalo Med. Jour.*

UNIVERSITY OF TORONTO.

The recent functions in the University at the opening of the session were exceedingly interesting. The new President, Dr. R. A. Falconer, was installed in the presence of a distinguished gathering in the new Convocation Hall, September 26th.

We extract the following from Dr. Falconer's address, delivered immediately after the ceremony of installation: -

If the University seems to stand to-day at the beginning of new expansion, this is the result of the self-sacrificing effort of many, continued through long years.

President Loudon has made the task of his successor in many ways easier than his own. In taking up this work I am conscious of the magnitude of the inheritance into which I have entered, and my hope is that, when I in my turn lay down my office, I, too, may be adjudged to have rendered this University the most faithful service within my power. The university is the centre for developing the nation's chief wealth—its manhood—and should therefore be its greatest school of efficiency.

No true university can afford to yield to the superficial demand for what is so often erroneously called the practical. We are true to the old university ideal in its essence when we insist upon the highest possible professional culture, many contributory interests, and a finely-tempered humanity.

There may be from time to time additions of new departments or faculties of study, and there must be an increase in post-graduate courses and research. Thus, the University of Toronto should occupy more and more a national position, doing the work for the whole Dominion by attracting graduates from every part to her well-equipped laboratories and class rooms.

The besetting academical sin is an intellectual aloofness, which occasionally makes the highly-educated man unable to appreciate the outlook of the average man; and the aristocracy of intellect is as exclusive as any other aristocracy.

There was an indifference on the part of the well-to-do to take up the burdens of civic and political life; there was antagonism between employer and employed, and there were great contrasts between wealth and poverty in our rapidly-growing cities. In the present social conditions the nation should look to the universities for distinct help.

In proportion to its population Canada had many students, and if only a moderate number of them carried broad human

interests into their professional careers the nation would soon reap the benefit of their training and the sympathetic study of its difficulties.

A Canadian university must have an individual character of its own, and it would be absurd to reproduce, even if we could, on Canadian soil the precise forms of the educational institutions and practices of other countries.

We must still aim in our education at the production of the highest possible type of citizenship. I believe that the highest type of citizenship cannot be permanently trained apart from a sense of obligation to and reverence for the moral order which is Divine. Religion is the crowning function of our manhood, for in religion we reach out to that which completes this fragment of the present.

The salaries of professors should be commensurate with the requirements of the social position in which they found most affinities, and he declared also that the university must retain its freedom.

The people of Canada look to the Universities for men who, unmoved by the enthusiasm of an hour, steadily cultivate the things of the mind and the spirit.

In the future they will censure us if we do not in this commercial time set for them professional ideals of a scientific standard and supreme in honor.

HONORARY DEGREES.

After the President's address the degree of LL.D. honoris causa was conferred on Robert Alexander Falconer, M.A., Litt. D., LL.D., D.D., President of the University; John Bach McMaster, Litt. D., LL.D., Professor of History in the University of Pennsylvania; Henry S. Pritchett, Ph.D., Sc.D., LL.D., President of the Carnegie Foundation for the Advancement of Teaching; Sir Sandford Fleming, C.E., K.C.M.G., LL.D., Chancellor of Queen's University; Cecil C. Jones, M.A., Ph.D., Chancellor of the University of New Brunswick; Alexander Charles McKay, M.A., LL.D., Chancellor of McMaster University; Howard Murray, B.A., Dean of the College, Dalhousie University; William Peterson, M.A., LL.D., C.M.G., Principal of McGill University; Hon. Alexander Cameron Rutherford, B.A., B.C.L., Premier and Minister of Education of Alberta; Right Rev. David Williams, D.D., Bishop of Huron, Chancellor of the Western University; Hon. Henry Esson Young, B.A., M.D., Minister of Education of British Columbia.

In absentia there were conferred similar degrees on Hon. J. A. Calder, Minister of Education of Saskatchewan; Hon. J. Dubuc, Vice-Chancellor of the University of Manitoba and Chief Justice of that Province; Right Rev. and Right Hon. A. F. Winnington-Ingram, Bishop of London; Mgr. O. E. Mathieu, Rector of Laval University.

The new Physics Building was formally opened by Sir Mortimer Clark, Lieutenant-Governor of Ontario, September 27th.

Dr. Loudon, the late President of the University, delivered an address. He first gave a brief history of the struggle to establish a physics department, a struggle which, commencing in 1870, had had so happy a termination. He hoped that after a long and fitful fever it might enter into a period of repose and peace devoted to progress. Might it be a place where the student, inspired by the true scientific spirit, might continue the work of research, and in that way attain the highest object of the University, which was to add to the sum of human knowledge, whether in letters or science.

THE MEDICAL FACULTY.

The opening lecture for the present session was delivered by Dr. Playfair McMurrich, the new Professor of Anatomy in the place of Dr. A. Primrose, resigned. Dr. McMurrich was introduced by President Falconer, who said he was very glad that one of his first duties was to introduce so distinguished a scientist. He gave a sketch of his career, telling of his graduation from the University of Toronto in Arts, from which he went to Johns Hopkins, where he was awarded the degree of Doctor of Philosophy. Later he had gone to the University of Michigan, where he had held the position of Professor of Anatomy for thirteen years, one of the leading positions in America. He had also become a member of many societies, contributed much to scientific literature, and in every way had shown himself to be a scientist of the highest rank.

Dr. McMurrich was given a very hearty welcome, and expressed his pleasure at getting back to his Alma Mater as a lecturer, especially when it appeared to be on the dawn of a golden age, and had had the fortune to secure for its chief executive officer a man of such ability as was displayed by the manly address they had heard in the afternoon. He then proceeded with an interesting review of the history of medicine and anatomy, largely academical in its nature. He traced the

development of the science through the dark ages by the Alexandra School, and said the first European school was founded in Salerno, Italy, by the Benedictine monks in the eleventh century. He impressed on the students the necessity of cultivating the attributes of a gentleman, and set forth observation, knowledge, independence and thoroughness as the qualities essential to the success of a medical man.

Dr. R. A. Reeve, Dean of the Medical Faculty, gave a cordial welcome to the first year students, and introduced Dr. James H. Richardson, who sixty years ago had been Professor of Anatomy in Old King's College, and afterwards in the University of Toronto.

The venerable professor expressed his amazement at the changes that had occurred since he began to lecture as a member of the faculty of Old King's College. Then the building had been about forty feet square, divided into two rooms, one of which was used for the study of anatomy and the other for chemistry. He had started with a class of fourteen students, which had grown to sixty within three years. Then an arbitrary act was passed abolishing the Faculties of Medicine and Law at the University, and for about thirty years there had been none. Chiefly through the efforts of Sir William Mulock a restoration had been effected, and now there was the splendid equipment for which he had long hoped, but never expected to see. Surrounded by every advantage that could be desired, the students of medicine should develop into ornaments to their profession or they alone would be to blame. Dr. Richardson was most warmly applauded, and forced to bow his acknowledgements several times.

WATER SUPPLY OF TORONTO.

We are glad to be able to publish herewith a number of articles or portions of articles on the subject of the water supply for the City of Toronto. This is a subject of great interest, not only to Toronto, but also to all the towns situated on Lake Ontario. It is, of course, well known that such experts as Drs. Bryce, Hodgetts and Amyot, Prof. Shuttleworth and others, have given the subject much consideration.

It is satisfactory to find that members of the City Council realize fully the vast importance of the various questions involved. We note with pleasure that one of the Controllers, Dr. Harrison, the only physician in the Council, has given the matter much study, and is able to express his intelligent opinions in a common sense way.

Most people will probably agree that the intake pipe should be carried farther out into the lake. The intake is now less than half a mile from the island, and should be carried out half a mile farther. It is said, however, that the City Engineer doubts the feasibility of such extension. We are told by practical men that it is possible to extend the intake pipe one half mile beyond its present position, because the water at the intake is comparatively shallow and the lake bed from this point slopes downwards very gradually for a considerable distance. It would not, however, be feasible to extend a pipe far from the eastern gap because there is in that region a sudden drop in the lake bed of about three hundred feet a short distance from the shore. Many are in favor of the establishment of a filtration basin on the island before any water comes through the new tunnel. The establishment of another reservoir in the west end of the city in the neighborhood of Wells Hill is worthy of careful consideration. It is thought by many that there is not so much urgency for the construction of a trunk sewer or a plant for the disposal of sewage.

It is fortunate that the City Engineer and Medical Health Officer are likely to come to a definite agreement in the near future, if they have not already done so. These two officers, together with the Waterworks Engineer, seem inclined to propose the establishment of septic tanks and possibly bacteria beds for the treatment of sewage, situated between the foot of Greenwoods Avenue and the Woodbine. The officers would probably also recommend some sort of filtration of the water.

Toronto is not like other cities, such as Chicago, Duluth, etc.,

because of the existence of the sand-bar, composed of the island and the strip of land running from the eastern channel to Kew Beach. This acts as a barrier, preventing the passage of the sewage from the city into the lake. There is only one large sewer which empties directly into the lake at the foot of Dufferin Street. These various points may be kept in view by the readers of the following interesting communications:

DR. H. B. ANDERSON.

From your question one would infer that the PRACTITIONER considers the building of a trunk sewer as essential to the solution of the problem of sewage disposal and water supply in Toronto. With this view I am heartily in accord. Any system which permits millions of gallons of sewage to be discharged daily into the bay, filling up the harbor and hopelessly contaminating the water in close proximity to the source of water supply for the city, and through which the intake pipe passes, is wrong, and constitutes with the growth of the city an increasing menace to the public health. The construction of a trunk sewer to convey the sewage well beyond the city is necessary. The method of treatment of the sewage before its discharge into the lake should not be a difficult problem. Whether the treatment shall be by filtration through the soil, septic tank and filtration, or chemical precipitation and filtration, involves so many points as to character and availability of land, comparative cost of different methods, etc., with regard to which I have no accurate data on which to base an opinion as to their relative merits. These data should be obtained through careful investigation by experienced and competent authorities to form a basis for final decision.

DR. WM. GOLDIE.

In answer to your inquiries *re* trunk sewer and the sewage disposal, I will be as concise as possible.

A trunk or gathering sewer is advisable so that sewage disposal can be regulated, and that some other place than our harbor can be filled up.

In disposing of the sewage it is obvious that no matter how much solid visible material may have been extracted, it must eventually reach the lake. At present the bay acts as a settling tank, and the discoloring sewage can, from the high build-

ings, be seen streaming out of the eastern gap and spreading out for miles.

The crucial point, then, is the contamination of the water supply, and this contamination must occur no matter at what point in the neighborhood of Toronto the entry may take place, the prevailing currents merely indicating the worst points of entry, not any safe point.

Theoretically there can be only three solutions of the problem, viz.:

1. Treating of the sewage to kill all injurious bacteria.
2. Obtaining water from a source whose drainage area is not inhabited.
3. Clearing the bacteria from the water to be used.

The first has never been accomplished with such a volume of sewage as comes from Toronto.

The second means an immense expenditure, but has been accomplished by many large cities.

The third is a well established scheme, to which the surrounding heights, with their sand beds, would point as the easiest of attainment.

DR. J. ORLANDO ORR.

In reply to your favor of October 2nd, I beg to say that I am not quite clear on the trunk sewer question. Much depends upon where it is proposed to empty the sewer.

The currents in the neighborhood of Scarboro Beach and the Island are not in my mind clearly defined or understood. If the Toronto Island is a quasi delta representing the division of the Niagara River current, one-half forming the Hamilton end of the lake and the other carrying away the wash from Scarboro Beach, it would then be safe to empty the sewage into the lake near Scarboro Heights. If such is not the case, it would be a dangerous thing to discharge it in that vicinity. The present conditions of emptying the sewage into the Toronto bay is not an ideal one, but it certainly is a safe one. The Toronto bay is a natural filtering basin for the purification of the sewage. Natural precipitation and the sunlight purify the bay so far as infectious germs are concerned. In addition to that it is impossible for the sewage in the Toronto bay to come in any way in contact with the intake pipe, as no matter which way the currents run, the island itself protects the intake from contamination.

The whole question of sewage disposal and water supply

must be considered together, and to my mind we have not sufficient data on hand to enable us to form a reasonable opinion. Precipitation tanks and filtration beds, as carried on in some places, in my mind, are not suitable for Toronto.

A simpler and more economical method can be found.

DR. N. H. BEEMER.

In answer to your letter of the 2nd inst., I would say that I am not in any way qualified to express an opinion on the subject of a trunk sewer for Toronto, as my attention has been directed officially to an entirely different sewage problem, namely, the disposal of the sewage of an institution limited to about one thousand inhabitants. From a long study of this question there appears in my opinion no doubt that the only adequate sewage system for an institution is the one known as the land disposal system or the intermittent downward filtration system, and in the near future one of the first duties of the government in selecting the site of any large new public institution will be to inquire, among other things, into the suitability of the soil for the disposal of sewage; indeed this question ranks in importance with that of water supply. At the London Asylum, where this system has been in successful operation about fifteen years, the question no longer is how to dispose of the sewage, but rather how can the greatest good be derived from its use. This system, which incidentally provides a most effective and valuable plan of irrigation, is simple, and after the ground has been once prepared it is easily managed throughout all seasons at a very small outlay, which is more than counterbalanced by the return from the small fruits and vegetables produced upon the ground. But this is all aside from the question which you submitted. Probably three of the most competent men to answer this question are Dr. Charles Sheard, of Toronto, Dr. P. H. Bryce, now of Ottawa, and Dr. C. A. Hodgetts, of Toronto, all of whom have devoted years of study to the subject of sewage disposal. Indeed it was while Dr. Bryce was Secretary of the Provincial Board of Health that the land disposal system was inaugurated at London.

Speaking in a general way it would appear that sewage deposited in the lake at Queen's Wharf would not be likely to pollute the water entering the intake pipe some distance south of the island, but of course that would really depend upon the deep lake currents, the exact location of which is not known to

me. Lake fishermen have told me that the deep currents along the shore in the vicinity of Toronto, and indeed for several miles out from the shore line, flow in a westerly direction, and they have so decided from the changed positions of some parts of their fishing nets. Their conclusions would seem to be supported by the fact that the bodies of those who have been drowned in the bay, or especially outside the island, have almost invariably been found at a point west of the scene of the drowning, and in one case as far west as the vicinity of Hamilton. These deep currents are apparently reverse or eddy currents, and their direction is probably determined by the course and direction of the main current beginning at the mouth of the Niagara River and ending at the source of the St. Lawrence. If this hypothesis be correct the sewage deposited in the lake at Queen's Wharf would find its way westward past the Humber and still further westward so that it might become a greater menace to the water supply of the Mimico Asylum than to the supply of Toronto. The pollution of the Toronto supply would more probably come from the Don and other small streams entering the lake east of and near the city along the north shore, but this would not be of serious consequence, as the impurities from these small streams would soon be cleared by copious dilutions with the comparatively large body of lake water into which they empty. It is conceivable, too, that the surface currents might not always correspond with the deep currents, so that chemical and bacteriological impurities might not always travel in the same direction. With the problems implied in these few observations it will readily be seen that any opinion without resting on all the ascertainable facts would not necessarily be of much value. Instead, therefore, of venturing any opinion on the subject, I would conclude that the proper method of reaching a solution would be for the city to appoint a special commission, say of the three gentlemen already named, to make investigations into the exact course, direction and extent of the deep and surface currents in both calm and stormy weather, and the distance to which dangerous bacteriological pollutions may be carried from the point of deposit. Then, also, if the commission were empowered to provide an equipment for the daily bacteriological examination of samples of water taken both from the outer and inner end of the intake pipe, the whole inquiry would result in incalculable advantage to the health and safety of the citizens of Toronto.

DR. W. S. HARRISON, CONTROLLER, CITY OF
TORONTO.

The most important question, probably, from any standpoint that touches the life and interest of a great city, is its water supply.

Toronto is to-day not in a satisfactory condition as regards its water supply and sewage disposal. This is of more importance to the masses than to the classes.

The two questions in Toronto of water supply and sewage disposal cannot be separated to obtain the results which are needed, namely: first, a pure water supply; second, the freeing of our bay from the continuance of the depositing of crude sewage into it, the solids of which in 1901 were estimated at ninety-five tons per day, and which are now no doubt double this amount. The general impression has been that the trouble was solely in the depositing of crude sewage at so near a point to the intake pipe from which this city derives its water supply, which is 2,250 feet from the south side of the island shore, at a depth of 75 feet.

The taking away of the sewage beyond the possibility of contaminating our water would not even then guarantee a pure water supply to the citizens, as contamination may arise from other points, and as the population of the suburbs and districts around Toronto, as well as possible pollution carried from other cities at times by currents in the lake will still infect the water supply, it would seem that treatment of our sewage alone will not settle the question.

I have studied the reports made by Mr. Jennings in 1890 and others down to the present time, and I believe the faults may be corrected:

1st. By establishing a proper filtration plant at the island, from which, by means of the water tight tunnel now being constructed under the bay, the citizens of Toronto would obtain water purified by filtration.

2nd. By the construction of a trunk sewer from the western portion of the city along some of the lower level streets along the water front to a point in the eastern portion of the city, probably at the east end of Ashbridge's Bay, and into which trunk sewer intercepting sewers from all portions of the city would empty.

3rd. By construction of proper septic tanks at the terminal end of the trunk sewer, and from these tanks outflow pipes at some distance into deep water in the lake.

The profession will know that while all impurities are not removed by septic tank treatment, the effluent contains very little that could be objected to when pouring into so large a body of fresh water as the lake, and which would become purified within a very reasonable area of the discharge pipe.

Further treatment of the effluent might be considered and bacteria or contact beds established to still further reduce the impurities that might be poured into the lake.

From an engineering standpoint this system is very easily carried out. I might touch for a moment on the financial side of the question, although to medical men this must always be secondary. We should demand a cost that would not be prohibitive. With the plan which I have outlined the cost will be cheaper than the plan which has been most favored in the past, and which was approved of by the late Provincial Board of Health, whereby the trunk sewers were to be constructed to a point in Ashbridge's Bay, in the east of the city, the sewage there treated by septic tank, and the effluent pumped against a head of 186 feet up into a section of six hundred acres north of the Danforth Road and east of Greenwoods Avenue, and there treated by land filtration. This plan did not take into consideration the filtering of the water at all. The cost of this was estimated in 1901 to be \$2,385,000. In the plan I have suggested there would be a saving of something like \$790,000 in plant and land which would not be necessary, as well as a saving in the annual cost of maintenance of about \$50,000, which capitalized would represent \$1,250,000, or the total saving would represent \$2,040,000. But against this we must place the cost of the filtration plant at the island, which is estimated to be \$1,750,000, which would leave approximately a saving by the plan I have suggested of an amount equivalent to \$290,000, so that from a financial standpoint this plan seems to be much preferable.

DR. P. H. BRYCE.

I have studied the several schemes which have, from time to time, been proposed to improve the sanitary condition of Toronto's harbor and water supply, and have formed opinions as to what ought to be done in the matter. As anything I might hitherto have said would necessarily have appeared official, I have been slow to do more than point out what ought not to be done, leaving for the municipal authorities the work of initiating new methods. Replying, however, to your request I shall broadly indicate what I deem the situation demands.

With a shore-line approximating twelve miles it is apparent that, apart from the pollution of Toronto and Ashbridge's Bay, the pollution of the lake water must gradually increase; but when to the increasing pollution of the two bays the latter is added, the extent and quality of the pollution will gradually approach that of Chicago, Cleveland and Duluth, all of which have for years had typhoid chronically present, and have had it lessened only in the degree that they have been able to prevent pollution of the lake water used as a public supply. Toronto similarly suffered, and it has only been since the pipe was made tight through the bay and carried into deep water beyond the island that relative immunity has been secured, owing to the island sand-bar lying between the bay and the intake. Experiments made in 1891 have shown that lake currents, caused by different winds, may at any time carry polluted water, either via the west or east gaps, along the south of the island to the intake.

With these facts in evidence it is plain that either (a) protection of the public water supply against pollution, (b) purification of the water after pollution, or (c) the doing of both, is essential to the safety of the citizens. You ask me my views on the situation, and, speaking generally, I would say that I am of the opinion:

1st. That with a main trunk sewer along the whole waterfront, and any necessary subsidiary ones, the purity of the city water supply can be assured if the sewage be disposed of by septic tanks and subsequent pumping to land areas for filtration, either to the sandbars south and east of Ashbridge's Bay and other made land there, or to the sandy plains to the east of the city, where sewage farms, as in Germany, France and England, can be made to pay the cost of pumping.

2nd. That sand filters on Scarborough Heights of sufficient extent would, if scientifically managed, probably give a pure water supply, even though the water pumped up were liable to pollution from the bay waters. The water might, however, be better taken from the present location of the intake pipe, where it is least liable to pollution.

3rd. As this second scheme still leaves the Don, Toronto Bay and Ashbridge's Bay extremely filthy, while the bay is still further injured commercially by filling up with sewage deposits, it seems evident that trunk sewers and the treatment of sewage are a necessity under any circumstances, since if a trunk sewer were constructed and the sewage pumped into the lake to prevent the filling up of the bay, the relief of the bay

would enormously increase the pollution of the lake water outside and, by so much, increase the danger from pollution of even filtered water.

I have long held essentially these views of the whole situation, and no recent developments have occurred to cause any material change in them. As to how best to arrange the distribution of the trunk sewers, the receiving tanks, to obtain the power for pumping economically, and to arrange the sewage farms, I have formulated views which have a practical bearing both on the economy of their construction and efficiency of their operation; but as your request does not necessarily include these within the scope of a reply, I need not burden this article with any suggestions.

PROF. E. B. SHUTTLEWORTH.

The question of the sewage disposal of Toronto is practically quite inseparable from that of its water supply. The new steel conduit across the island, and its extension into the lake, with the tunnel now under construction, indicate that for some time at least the city will obtain its water from Lake Ontario, at or not far distant from the present intake. Any remarks that I may make will, therefore, only refer to existing conditions as to water supply, and, at the outset, I may say that on several points the available data are insufficient to justify any definite expression of opinion.

In a communication of this kind it is impossible to deal in anything but a very general way with the momentous questions involved, but the principle may be laid down that no plan can be considered which has for its object the deposition of raw sewage in the lake. Such would be a direct violation of modern sanitary practice, and most likely be at once disapproved by the government. More than this there would be a real danger that sewage deposited at a distance of say three miles east of the city would, under certain conditions, find its way to the water intake. The sand carried from Scarborough Heights by any eastern storm, and deposited along the island shore to its extremity opposite the Queen's Wharf, is perhaps sufficient proof of this. Additional evidence of the effect of easterly and south-easterly winds in contaminating the city water is afforded by the records of scores of bacteriological examinations which I have made during the past fifteen years. All of these point to sewage pollution, characterized by the presence of the colon bacillus. This contamination apparently originates in material

which has escaped by the eastern channel, and in order to reach the intake has to travel nearly two miles. It may be argued that if partially purified sewage can be thus carried such a distance, the immense volume of crude sewage, with its floating and suspended burden of undecomposed or fermenting solids, would be transported to a degree inversely proportional as to distance, and directly so as to quantity. I had long since arrived at a conclusion in regard to this matter, and the experience of years has only served to confirm it.

If it is conceded that it is impracticable to pour crude sewage into the lake it is evident that such must undergo treatment. This may roughly be classed under three heads: (a) Precipitation by chemicals, (b) irrigation, (c) septic tank treatment and filtration. Experience derived from precipitation works, in many places, is unfavorable to this mode, and may be at once dismissed. Irrigation demands a large area of land which, in the case of Toronto, could only be found at a considerable elevation, entailing a costly pumping plant and high working expenses. There remains the septic tank method, which, if properly carried out, with a sufficient area and contact beds, has been proved effective, and promises to solve the Toronto problem, though at a very considerable cost.

People speak of the bacterial method as something new, but the process, as such, is as old as civilization, and in origin coeval with nature itself. Though unrecognized, it has been used in Toronto since the first sewer poured its contents into the bay, and has done its work in a very efficient and wonderfully inexpensive manner. This natural septic tank is about two miles long, a mile wide, with a depth up to twenty-five feet, and is so protected that the lower stratum of water is practically undisturbed for the operations of the anaerobic bacteria which for many years have been busy in converting into simpler, less offensive, and less dangerous forms the organic matter in the twenty to thirty million gallons of sewage daily contributed by the city. If the effluents which, according to the prevailing winds and their resultant currents, now issue from the eastern and westerly channels, and the marsh canal, could be controlled and submitted to the action of the aerobic micro-organisms by which katabolism is carried to its termination, the system would be complete. As it is, it is probable that more than half the organic solids are so disposed of, while the danger is minimized to more than this extent by the crowding out of pathogenic bacteria by the sewage forms more especially adapted to the environment.

I have lingered on this part of the subject in order to emphasize the fact that it would be a very easy thing to do a vast injury by diverting the sewage outfall to another locality, not land-locked, but subject to storm and current, which would not only destroy the conditions necessary to anaerobic change, but would be liable to carry unmodified sewage, with its peculiar germs, to the water intake.

The selection of a location for a septic system is largely influenced by engineering considerations and cost. A large area would be required, and, if above the general level of the city, heavy pumping charges would be incurred, and provision for the disposal of the purified effluent would have to be made. A low level, where the sewage, or most of it, could be carried by gravitation would be much preferable, and it may be that the eastern part of the shore of Ashbridge's Bay would be suitable for the construction of septic tanks, while the filling in of the bay would afford adequate room for the necessary beds. The word "necessary" is used advisedly, for I fear that the discharge of the septic tank effluent, without thorough subsequent treatment by repeated contact beds, would be attended with risk to the water supply. The whole question of locality demands further investigation, but the above, which is based on plan No. 3 of the engineer's report for 1901, seems to give the greatest promise.

Whether the sewage is to be carried by an intercepting sewer along the city front, thus involving pumping to the proper level; or whether, in addition to this, there be an intercepting sewer to carry off, by simple gravitation, the sewage from levels above, say, Wilton Avenue, is purely a matter for the engineer, and has already been treated with thoroughness in the plans of Hering and Gray and those submitted by the City Engineer. As soon as the point of treatment is selected the sewer should be at once commenced, for it will be a work of years, and procrastination will only defer the inevitable.

DR. JOHN A. AMYOT.

The death rate in Toronto for the last five years from typhoid fever was 22 per 100,000 of the population. This is not excessive, but more than twice as high as that of any city having an unquestioned water supply. The unavoidable, or rather that due to our neighbors, is 8 per 100,000 in general.

During the last four years 16.8 per cent. of the daily samples examined in this laboratory of Toronto water showed the

presence of colon bacilli or intestinal bacteria in so small quantities as 1 c.c. This is considered a severe infection. The data at hand seem to point to the intake as the source, and this is not to be wondered at from its position between the outlet at the eastern gap and the sewers on the shore to the west of the island. On several occasions I have been able to detect chemically and bacterially the presence of sewage right over the intake, depending on the direction of the wind. The danger is continually menacing, and will in all probability get worse as time goes on and the population supplying the sewage increases.

Two remedies present themselves: 1st, a complete sterilization of the sewage, or, 2nd, filtration, after modern methods, of the present water supply.

According to methods now in use, to sterilize the sewage it would require a trunk sewer from the extreme west to the extreme east of the city, several miles; a collecting basin or septic tanks large enough to hold 30,000,000 gallons (this would mean a covered reservoir 1,200 feet x 400 feet x 10 feet deep); a pump equal in capacity to the present city water plant to lift the sewage 200 feet (the present water head is 219 feet), and distribute over perhaps 400 or 500 acres on the sandy land at Danforth Road. During fair weather this would do the work pretty nearly perfectly, and protect the water intake. But we would still have the effluents from the Don and the Humber Rivers. The island would be difficult to connect up, and, as has happened in other places, certain other sections of the city would not be connected up and their sewage would go untreated. And again, in case of heavy rains the whole plant would be put out of commission, and untreated sewage would necessarily have to overflow into the lake. A 30 million pump would not be able to handle 100 million gallons. This would cost about \$6,000,000. The maintenance would be high, even higher than to now pump our water. The shipping going in and out of the bay is not a negligible item either.

No other method so far devised for sewage disposal could be thought of for a moment as an efficient or even as an approximately efficient method to protect our water.

Now as to the 2nd, filtration of the water. By this the water can be made as nearly absolutely pure as possible. Where it has been done properly, the rate of typhoid and other intestinal diseases has been brought down to that of cities having strictly unimpeachable water supplies—snow caps, or deep artesian wells. The first necessity here is a pure water supply. Fil-

tration will give it. The plant will cost probably not more than \$1,000,000. Albany, with an expensive plant and an awful water, produces 15,000,000 gallons of pure water for \$3.00 per million out of a plant that cost \$450,000. We need 30,000,000 a day here. We could filter twice as much as Albany does by its plant, our water being so little turbid and being so much better to commence with.

We put 200 tons of solids into the bay every twenty-four hours. With our water purified the problem is the removal of this. This could be done by a short trunk sewer and collecting basins, where the solids could be collected and carted away at very little expense, or perhaps better still by a series of short sewers, say Yonge, Church and Jarvis into a septic tank, then Sherbourne and Parliament into another, and so on. This could be done at very little expense, and at one swoop would remove one-half of all the harmful stuff in the sewage. Only liquids would pass over, thus avoiding the filling up, and this could be rendered very much less harmful by treatment with free chlorine. The maintenance would be slight. This last plan, with water filtration, would give us pure water, a clean harbor, and at an expense probably one-third of the first plan, with little expense for maintenance. My plan would then be:

1. Filtration of our water.
2. Short intercepting sewers with septic tanks, with chlorine sterilization of the effluent from the tanks before discharge into the bay and lake.

DR. CHARLES H. HODGETTS.

Two important questions confront the citizens of the City of Toronto, both of which are a present menace to the health of its inhabitants and the many visitors who sojourn in its midst. The first and most important is the providing of a potable water supply, and the second the economic and yet efficient disposal of its sewage.

To permit of a better understanding of the two problems, a brief statement of the existing conditions is necessary. The bulk of the city sewage is deposited daily into the waters of either Toronto or Ashbridge's Bay, from which it finds an outlet into Lake Ontario through three channels, two being located to the east and one to the north-west of the intake of the water supply located to the south of the island in Lake Ontario, while a considerable quantity is deposited directly into Lake Ontario.

The effect of this primitive method of sewage disposal has

been to convert the Toronto bay into a cesspool. It will thus readily be seen that not only many million gallons of sewage are deposited within a short distance of the water intake, but there exists in the Toronto bay a huge septic tank containing millions of gallons of diluted septicizing sewage which is constantly overflowing through the two outlets into Lake Ontario. With this large amount of flotsam and jetsam, both macroscopic and microscopic, so near the water intake is it to be wondered at that pollution of the water supply occurs so frequently?

How could it be otherwise, for the water supply is derived from the same body of water into which the whole of the raw sewage is daily deposited.

It is not the intention in this article to do more than refer to the menace to health and life from this condition of affairs, and, consequently, the large annual financial loss occasioned thereby; not a home but at one time or another has felt the blow.

The latest reports show that the typhoid rate is rising, and unless some immediate and important action is taken it must continue to rise, for, notwithstanding the use of the much-vaunted tunnel, pollution at the intake is gradually increasing.

The conditions can be prevented, the demand for a guaranteed potable water can be satisfied, and the deposition of raw sewage can be avoided.

The first thing to be done is to provide a pure water which can be obtained by a system of slow sand filtration, the filters being constructed on the general principle as adopted in many European cities, as also at Albany, Philadelphia, and other cities of the United States, where 99 per cent. of purification has been obtained when operated by skilled superintendents.

What, then, has the filtration of water to do with the question of sewage disposal? Just this: The construction of filters is the first line of defence, and with their installation the health of the citizens is assured in so far as the danger from water-borne diseases is concerned, and the method by which the sewage will be disposed of is simplified and cost of construction and operation very materially lessened. For with the filtration of water it is possible to eliminate the filtration treatment of the sewage and yet at the same time prevent the sludging up of Toronto harbor and Ashbridge's Bay, which is desirable on both sanitary and commercial grounds.

It is not necessary to enter into any lengthy discussion of the manner in which this partial purification of the sewage can be

secured. Suffice to intimate it can be done, and without any enormous expenditure on account of a trunk sewer—septic tanks being constructed at different points along the bay front.

Looking to the growth of the city and the requirements of a population of half a million or more of people for both domestic, manufacturing, fire and other purposes, it does seem but rational that the filtration plant, with the adjunct additional storage reservoirs, should be so located as to permit of a gravity system—for given a sudden or extraordinary demand for water, say for fire purposes, or on account of any unforeseen accident whereby an increased amount of water is required, the system should be able to meet the demand, and this can only be satisfactorily done in the manner indicated; for if filters are overworked their capacity for removal of impurities is lessened, and this is a contingency likely to arise if the filters are placed at a low altitude and operated without the addition of one or more storage basins.

In conclusion, a few words may be said in reference to the cost of construction and operation of slow sand filters. The expense of covered filters runs from \$40,000 to \$60,000 per acre of filter area, while that of operation is computed at from \$2.00 to \$3.00 per million gallons filtered, and it is no low estimate to say that Lake Ontario water can be filtered at the rate of five million gallons per acre per diem.

If the scheme thus briefly outlined is elaborated, the city will secure filtered water and will be able to dispose of the sewage without being called upon to adopt an expensive disposal system, and both systems can be installed at a cost within the means of the ratepayers.

Personals.

Dr. J. D. Thorburn, of Toronto, has typhoid fever.

Dr. H. M. Little, of Montreal, left for Europe, October 23.

Dr. Hugh Cuthbertson, of Chicago, paid a short visit to Toronto, October 18-19.

Noble, the man who assaulted Dr. Eadie, of Toronto, has been sentenced to six months' imprisonment.

Dr. F. L. M. Grasset returned to Toronto, October 6th, after spending three months in Great Britain.

Dr. Etherington has been appointed Professor of Anatomy in the Medical Department, Queen's University.

Dr. Wm. Oldright returned to Toronto, October 18th, after a three months' visit to Great Britain and the Continent.

Professor Robert Koch, who went to Uganda, in Africa, to investigate the sleeping disease, has returned to Germany.

At the recent Convocation of Queen's University, October 16th, the degree of Doctor of Laws was conferred on Dr. W. B. Geikie, of Toronto.

Dr. C. A. Page (Trin., '98), of Kingsville, Ont., has gone abroad to spend two years in post-graduate work in Edinburgh, London and Vienna.

Dr. Newbold Jones announces that he has opened an office at 42 Prince Arthur Avenue, Toronto, and will confine his attention to Pathologic and Aural practice.

Dr. Chas. W. Hoare (McGill, '88), of Walkerville, Ont., has been elected representative of the Medical Council for Division No. 1, succeeding Dr. Bray, the present Registrar.

Sir Henry Albert Pitman, who entered upon his 100th year last September, is the oldest physician in Great Britain. He has been connected with the Medical Staff of St. George's Hospital, London, and is still Senior Consulting Physician to that institution.

A. Yale Massey, B.A. (Tor., '93), M.D. (Trin., '98), has been elected one of the original Fellows of the newly instituted Society of Tropical Medicine, of London, England. Dr Massey is practising in Central Africa, and has published several papers on tropical subjects.

Dr. Loir (a nephew of the famous Pasteur), an eminent French physician, was recently appointed a member of the medical faculty of Lavelle University. Archbishop Bruchesi, however, has refused to allow him to work in the faculty for the time being, because Madame Loir is suing for divorce. On October 16th, Dr. Loir was given a year's leave of absence, with the hope that within that time the suit will be settled.

Mr. Henry James, who died in Brantford, Ont., October 10th, left an estate of \$45,000. A little less than one-half of the income of the estate is, for twenty-one years, to be paid to the Hospital for Sick Children in Toronto, and for the benefit of ten girls, students at the Institution for the Blind at Brantford, said girls to be selected by two persons who are named. The balance of the income is to accumulate for twenty-one years, and at the end of that time the entire estate will go to the Hospital for Sick Children at Toronto.

Obituary.

KENNETH M. MACKENZIE, M.B.

Dr. Mackenzie, of St. Thomas, died in Ottawa, Sept. 7th, from diphtheria and pneumonia, aged 23. He received his education at Toronto University, and after graduating last spring was appointed one of the house surgeons at the Ottawa Hospital.

HUMPHREY EWING BUCHAN, B.A., M.D.

Dr. H. E. Buchan, Assistant Medical Superintendent at the Asylum for Insane, London, Ont., died at Owen Sound, October 17th, aged 65. The cause of his death was apoplexy.

After graduating in Arts and Medicine from the University of Toronto he went abroad and did post-graduate work in Glasgow, Edinburgh and London, and passed the examination, for years known as the double qualification, of Edinburgh and Glasgow. He then returned to Toronto and practised medicine for a number of years. About twenty years ago he entered the Asylum service, where he remained up to the time of his death.

Correspondence.

EXETER MEETING.

To the Editor, THE CANADIAN PRACTITIONER AND REVIEW:

SIR,—I read with surprise and regret an editorial in the last number of *THE PRACTITIONER*, referring to the treatment of some Toronto visitors at the recent meeting of the British Medical Association at Exeter.

It is quite true that we all did our best to entertain the Association here last year, and it is equally true, I am sure, that we did it for the public good and for the honor of the profession, and not for any end of our own.

I would like to state that I arrived at Exeter from London about 6.30 p.m., July 31st, and telephoned to the local Secretary, Dr. Andrew, who at once gave me an address at which I found comfortable accommodation. Before I was out of my room next morning I received an invitation to luncheon that day at the residence of an Exeter physician previously quite unknown to me. This was a delightful occasion, and I met there a number of English members of the Association, one of whom, a well-known surgeon in Harley Street, London, at once invited me to dinner there on Saturday night, August 3rd (and a most agreeable dinner party it was).

To return to Exeter. I went into one of the sections that morning, and sat down in a back seat. Before I had time to look about me, the Secretary came down and whispered in my ear, "I am right, am I not? You are Dr. —, of Toronto? I was sure it was you. The Chairman would like you to take part in the discussion."

The same morning, in the General Secretary's office, I was regretting that I was too late to get an invitation to the garden-party of the Bishop of Exeter. No sooner had I said so than one of the assistants answered, "If you will return at two o'clock this afternoon, I am almost sure I can get a card for you." I returned, and got the card.

At night I went to the entertainment in the Rougemont Hotel, and on my way, as I was alighting from the tram, one of the members of the Committee, who happened to sit opposite to me in the tram, addressed me, with no preface nor introduction, saying, "I am a member of the Committee, and I have not been able to find anyone yet to make myself useful to. Will you not join us?" and escorted me in. Though it was

late, my new friend found the Lady Mayoress, and presented me to her. I had a hand-shake and a hearty welcome, refreshments and a comfortable seat, listened to charming music, and altogether spent a pleasant evening.

At the Saturday night dinner-party in Harley Street, our hostess remarked, "Great Britain ought to feel, and does feel, to Canada, just the way that I do to my one daughter and my two sons." This was the spirit that I met in England. I received a kind welcome and great courtesy both in Exeter and in London, just because I was a Canadian.

I am, Sir, Yours, etc.,

B. M. A.

Morphine and Retention of Urine.

In a recent clinical lecture Sir Wm. Bennett relates an interesting experience which may be usefully noted for practical application. The lecture, among other aspects of difficult micturition, related to those cases in which, though the urine either is not or cannot be voided, a catheter of full size is readily passed into the bladder. To illustrate a possible cause of this condition Sir William quotes the case of a young man who at occasional intervals suffered from retention of urine, compelling the use of a catheter. This condition had brought him under the notice of many medical men, but no effective interpretation or solution of the problem had been found. A remarkable feature of the case was the fact that the patient appeared to think very little of the matter, and was almost or altogether free from anxiety and distress—this being, of course, in marked contrast to the acute alarm which inability to pass water usually excites in the ordinary individual. In the course of examination, however, it was observed that on the thighs were a number of spots suggestive of the bites of some insect and similar spots, some indurated, were present on the forearms. For these, as is invariable in such cases, the patient had an explanation in the shape of an "irritable skin." But it was manifest to the experienced eye that the marks found on his limbs were produced by a hypodermic needle, and thus the conclusion was inevitable that the patient was a victim of the morphine habit, and that the recurring retention of urine depended on an occasional excessive dose of the drug. The case illustrates the necessity of the "detective method" in clinical work, more especially where there is a mystery to be cleared away.—*The Hospital*.

Book Reviews.

THE MAJOR SYMPTOMS OF HYSTERIA. Fifteen Lectures given in the Medical School of Harvard University. By Pierre Janet, M.D., Professor of Psychology in the College de France, Director of the Psychological Laboratory in the Clinic of the Salpêtrière. New York and London: The Macmillan Company of Canada, Ltd., 2 Richmond Street West, Toronto. Price, \$1.75.

This volume deals with a disease very common in general practice, and one which the medical profession has sadly neglected, greatly to the fattening of Christian Science, the Dowieites, and a whole host of other ghouls who prey on the credulity of their fellow-man, or more often woman. Prof. Janet deals with the subject in a masterful way, as becomes one whose life is spent in the Salpêtrière, where hysteria has been closely studied for half a century and more. His construction is always clear, although it has a Gallic halt at times; the treatment of the subject is logical and convincing, and as a whole it is one of the most interesting books we have come across for many a day.

DISEASES OF INFANCY AND CHILDHOOD. Their Dietetic, Hygienic, and Medical Treatment. A Text-book Designed for Practitioners and Students in Medicine. By Louis Fischer, M.D., Visiting Physician to the Willard Parker and Riverside Hospitals, of New York City; former Instructor in Diseases of Children at the New York Post-Graduate Medical School and Hospital, etc.; Fellow of the New York Academy of Medicine. With 303 text illustrations, several in colors, and 27 full-page half-tone and color plates. 979 royal octavo pages. Extra cloth, \$6.50 net; half-morocco, \$8.00 net. Sold only by subscription. Philadelphia: F. A. Davis Company, publishers, 1914-16 Cherry Street.

In the preface to this book the author emphasizes the rapid strides that have been made in the diagnosis and treatment of disease in children, and, while bringing into prominence new methods, the teaching of the book is sound.

Infant feeding in all its phases, maternal nursing, wet nursing and hand feeding with home modification for bottle feeding, are very fully discussed. This part and the part on infectious diseases are particularly good.

There are many things in this volume which one does not expect to find, but which are never out of place, *e.g.*, methods of examination of stomach contents, urine examination and bacteriological memoranda; also a chapter devoted to blood examinations, giving the various stains, etc.

Part X. is devoted to diseases of the eye, ear and skin.

Part XI. deals with orthopedics.

The result is a volume of 980 pages. Many of the subjects are fully discussed. Nothing is omitted.

It will make an excellent working volume with Holt—the one supplementing the other in many ways.

PROGRESSIVE MEDICINE. Vol. III., Sept., 1907. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Octavo, 290 pages, with illustrations. Per annum, in four cloth-bound volumes, \$9.00; in paper binding, \$6.00; carriage paid to any address. Philadelphia and New York: Lea Brothers & Co., publishers.

The contents of this volume are: Diseases of the thorax and its viscera, including the heart, lungs and blood-vessels, by Dr. Ewart; dermatology and syphilis, by Gottheil; obstetrics, by Davis; and diseases of the nervous system, by Spiller.

This quarterly always comes a welcome visitor to the editorial desk, because it has, in the shortest possible space, all the important advancements that have been made during the past year. There is nothing equal to it for keeping up-to-date.

INFLAMMATION. An Introduction to the Study of Pathology, being the Reprint (Revised and Enlarged) of an Article in Professor Allbutt's "System of Medicine." By J. George Adami, M.A., M.D., F.R.S. Macmillan & Co., Limited, London, Eng.; The Macmillan Co. of Canada, Limited, 27 Richmond Street West, Toronto. Price, \$1.50 net.

It is a remarkable departure that an article appearing in a System of Medicine or Surgery should be reproduced in volume form. This work by Professor Adami on Inflammation is so comprehensive, concise and up-to-date that there is little wonder that a demand has arisen for this chapter in book form.

It is a great compliment to Prof. Allbutt that his choice of authors has met with such popular approval. The sentence in the preface, "A knowledge of the inflammatory process is the foundation of all pathology," is a truism, and it would be a great deal better if this volume were in the hands of every practitioner, and carefully read by all. It deals with the subject of Inflammation from its simplest to its most complicated form, and it does more than that, it deals with the principle of treatment of inflammation. The Opsonic theory of Sir A. E. Wright and the cupping treatment of Prof. Bier have each received attention and their action discussed.

We can heartily recommend this volume to all students and practitioners, and feel perfectly satisfied that great benefit will be derived from its close study.

Stypticin in Uterine Hemorrhages.

Migoul (*Bull. gén. de thérapeutique*, April 8, 1907) states that cotarnine hydrochloride (stypticin) being an opium derivative, has the advantage of being at once a vasoconstrictor and an analgesic agent. It acts simultaneously upon the uterine vessels and upon the pains. He has obtained better results from its employment in the excessive menstruation of young girls, with or without dysmenorrhœa, than from any other remedy. He does not recommend, in such cases, going above the daily dose of 5 grn. for fear of stopping the menstrual flow. He advises preliminary treatment for one week before the date of menstruation, giving half the dose, or $2\frac{1}{2}$ to 3 grn. during the day, in three or four tablets. In symptomatic hemorrhages, attending uterine lesions, metritis, deviations, etc., this agent seemed to be the best of the vasoconstrictors. Upon leucorrhœa it has no action. Its use does not prevent or take the place of curettage, if this is indicated. In interstitial and submucous fibromata, the profuse bleedings are treated with the agent, with the most satisfactory results. In five cases the bloody discharges between the menstrual periods completely disappeared. In two others cases in which the hemorrhages recurred he was obliged to increase the dose to six or seven tablets. The remedy stypticin seems to have no influence in causing atrophy or the disappearance of the fibroma; but the latter is arrested in its evolution, and if an operation should be decided upon, the uterus is placed in the best condition for operating. In cancer of the uterus, it diminishes the hemorrhages, but its action upon the pain is problematical.—*N. Y. Med. Jour.*, May 18, 1907.