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Original Communications.

RECENT CONTRIBUTIONS TO THE THEORIES OF IMMUNITY.*

BY DR. WM. H. WELCH,

Professor of Pathology, Johns Hopkins University, Baltimore.

There has been no subject of so great interest to bacteriologists as this, and indeed none of greater interest to medicine in general. The theories have more than theoretical interest, because the deductions of so great practical importance have come almost entirely from the working out of theories. One's theories as to the nature of disease determine to a great extent one's method of practice, and even those who consider themselves eminently practical will find that they are very much influenced by theories. So no apology is necessary in calling your attention to this subject.

The understanding of immunity is an insusceptibility to infectious diseases, and that immunity may be natural, pertaining to the race or individuals of the race, or it may be acquired. It may be acquired in different ways, by having had a natural attack of the disease, or acquired by artificial methods. Physicians of the earliest time were familiar with the fact that certain diseases left behind an immunity that might be transitory or life-long in its duration. It was not until recent years, however, when it was found possible to produce immunity experimentally that we had any idea of the factors concerned in the production of immunity. We have had for over a hundred years a striking example of immunity, that is, the immunity against

* Read at meeting of Clinical Society of Maryland.

small-pox by vaccination. The fundamental nature of this was not understood until Pasteur's experiments in 1880. Since that time we have discovered the specific germs of a large number of diseases, and it has been found possible to produce immunity against nearly all of the pathogenic diseases by methods of vaccination. The immunity produced in that way, by the inoculation of an animal with virus, is known as active immunity, and it is brought about by the introduction of the germs of the disease, or their products. The discovery that it was possible to produce active immunity by the use of the chemical products of the germs is one of fundamental importance. It was really made in this country by Theobald Smith and some one associated with him in the study of hog cholera, and the most interesting forms of experimental immunity are those produced in this way. The induction of that sort of immunity is always attended by a certain amount of reaction, and it takes time for the immunity to be brought about. The reaction usually takes place partly at the seat of vaccination and partly constitutional, and it is questionable whether any substantial active immunity can be brought about without attending reaction. The reaction that attends the introduction of cow-pox is a good illustration. You have a local reaction and a certain amount of constitutional disturbance. It is also to be noted that it takes a certain amount of time, a matter of days, or perhaps weeks, before the substantial immunity is attained.

Now it was found by those first interested in the theoretical question that the cells and fluids, particularly the blood of animals that had been rendered actively immune, that these humors of the body had acquired new and extraordinary properties which they did not possess before. We are concerned more particularly with the presence in the blood of such animals of protective or healing substances, though they are not the only changes in the blood, for we have agglutinine, for instance, which has no healing or protective power whatever. As regards the healing and protective substances found in the blood of those actively immune, they can be transferred to another animal or individual, and can also produce immunity there, but the immunity brought about by transferring to another animal substances produced by vaccination in the first animal is very different from the natural immunity, and it is spoken of as passive immunity, the conception being that the protection through the immunity substance generated by the first animal is transferred, but the individual receiving this will not have any marked reaction, really no reaction at all, the immunity coming on at once, or after a very short period, and it is also of only transitory duration.

Passive immunity is brought about then by transferring to a healthy animal some of the immunity substances generated by vaccination in another animal, and it is attended by no reaction, the degree of immunity produced being directly in proportion to the dose of the serum, and lasting only for a short time, whereas the active immunity may last for several years at least.

Now it is found that the basis of active immunity is not the same in all animals, and it has become clearer and clearer that every micro-organism is a problem in itself. Bacteriologists have ceased to believe that there is any single law under which all the immunities can be brought. Each disease is a problem by itself, and it is extremely unsafe because one has found an explanation of the immunity of one organism to suppose that it applies to the immunity of another disease. There are two kinds of immunity substances, one that has the property of antagonizing the specific poison produced by the organism causing the disease, that is, an antitoxine, and a second kind of protective or healing serum, which has the property of destroying the micro-organism which is concerned in producing the disease, a bactericidal immunity. As examples of the first class are those antitoxines produced from diphtheria, tetanus and snake venom, while as examples of the second stand cholera and typhoid fever. Then in a number of experimental immunities we are at present insufficiently informed as to the basis of the immunity, whether it is antitoxic or bactericidal. The evidence seems to be that there are other explanations for these.

Now let us consider for a moment the nature of the antitoxic immunity. They can be produced only when you have in your hands in the first place a toxine, and a strong one at that; and not all bacteria produce strong toxines in our artificial cultures. The fact that a germ does not produce a strong toxine, however, in our experimental work, does not prove that it will not do so in the human body. If one could get a strong toxine from the cholera vibrio, or the typhoid bacillus, there is no question but what we could produce a high degree of antitoxic immunity, and it would be of high healing value. Metchnikoff is not satisfied with the view that cholera does not produce a strong toxine, although we have not been able to demonstrate it yet, and other workers are devoting their time to an effort to produce a strong toxine from the germ of tuberculosis. We must have then, first, a strong toxine, and that when introduced into a susceptible animal, first, of course, in a small dose, and then in gradually increasing doses, in the course of time produces a high degree of antitoxic immunity. That means that the blood and tissues of the animal have acquired the property of being an antidote to the poison, but that antitoxine has the property

of antagonizing only that particular poison. It is entirely specific. The diphtheria antitoxine is an antidote to the diphtheria toxine and to nothing else. Any unpleasant effects that result from the introduction of the antitoxine are due, not to the antitoxine, but to the vehicle that contains it, namely, the serum. It is impossible to isolate the antitoxine in pure state. It has never been obtained in a condition distinct from the reaction of proteid substances. Perhaps it is questionable whether the proteid acquired the antitoxine property just as iron acquires magnetism, but this is impossible to demonstrate. We are not then accurately informed as to the chemical nature of the antitoxine. A very important question arises as to the origin of the antitoxine. Buchner thought it was in some way derived from the toxine, and that it was a transformation, while another view supported by Behring is, that it is something produced in the body, presumably by the cells of the body, through a reaction set up by the action of the toxine. These two theories set over against each other without any conclusive evidence in support of either until about a year ago, when Erlich advanced an hypothesis, which can be put to the test of practical experimentation, and which, whether true or not, is an important contribution. The argument is something like this: the susceptibility to the toxine depends upon the presence in the body of cells that have an affinity for the toxine. The toxins are unlike most poisons with which we are familiar, and have a special affinity for the protoplasm of certain cells of the body. This has been demonstrated by the actual study of tetanus, where the nerve cells undergo a specific change. Susceptibility then to this toxine means that the individual has nerve cells, the protoplasm of which has a definite affinity for the tetanus toxine, and that animals which are not susceptible, the hen, for instance, have nerve cells, the protoplasm of which is of a different quality in that respect. Now he supposes, on the basis of studies that antedated altogether the bacteriological studies, that in the protoplasm there are different sets of molecules, sets of side-chains, if you please, and it is among these we are to search for the cells that have the definite affinity for the poison. He calls these groups of cells the toxiphoric group. Now the most remarkable point is that he has come to the conclusion, partly from reasoning, and partly from experiments, that antitoxine is nothing more than this normal constituent of the nerve cells that has the power of binding toxine, and that antitoxine, therefore, is something that exists normally in the cells, and is set free according to this principle. The toxine must first be introduced, and being introduced in a dose less than the fatal dose enters into combination with the protoplasm of the cells, and damages those special cells and no others. It

unites with the toxiphoric group of cells, causes a destruction of their function, so far as the action of the cells is concerned, for after the union the cells are defective, and in consequence of this the cell is stimulated by what is a general pathologic law to produce more of that substance, and according to an equally well-known law, it is over-stimulated, so that an excess of the substance is produced to overcome the loss. If, then, you keep introducing toxine you continue producing a combination until so much of the substance is produced that there is no room for it any longer in the cells; it is set free and accumulates in the blood; so an antitoxine is a substance normally present in the cells, which are stimulated to excessive growth, and it is consequently set free to circulate in the blood. This has aroused the greatest interest among bacteriologists, and is certainly one of the most important and ingenious explanations ever offered.

Now if this be true there should be means of demonstrating it. In other words, if the brain or spinal cord does contain tetanus antitoxine normally, we should find that it neutralizes the toxine outside of the body, because if you mix toxine and antitoxine in a test tube in proper proportions the combination is harmless. Now it has been found that if you make an emulsion of the brain or spinal cord in salt solution and add to that ten times the fatal dose of tetanus toxine, let them remain for a few minutes and then inject the mixture, the toxine will have been neutralized just as if you made the experiment of mixing toxine and antitoxine. This experiment was, of course, made at once, and it is thought to bring evidence that there is in the brain and spinal cord a substance which has the power of binding the tetanus toxine and making a harmless combination. The mixture of tetanus toxine with the emulsion of liver, kidney or other organs of the body has no similar effect, and therefore it is something apparently specific for the nerve cells.

That is Erlich's view then, and he thinks the same will hold true as to other antitoxines. It remains to be found out, for instance, in diphtheria, what cells or group of cells has this special affinity for the diphtheria toxine. It is only a theory and it is not proven definitely that the identity of this substance in the brain and cord is the same as the antitoxine. The experimenter in the Pasteur Institute, Metchnikoff, Reux and others have brought forth arguments opposed to this interpretation, one of the most curious being that if you mix finely powdered carmine with the toxine you get very much the same action as if you mixed the brain emulsion with it, and if that be true it is certainly very important. The theory is so suggestive and so important I thought it might interest you to have your attention called to it.

Now as regards the other kind of immunity, the bactericidal, that was discovered by Pfeifer in his experiments with the cholera vibrio. You can render immune a guinea-pig, which is highly susceptible to the poison of cholera by inoculating it with the living or dead cholera bacilli, using first small and then gradually increasing doses. There is here no antitoxic action. If you mix the serum of the animal with the living culture of the cholera bacillus no change takes place except that of agglutination. If you introduce the living cholera culture into the peritoneal cavity of the guinea-pig that has been so vaccinated a phenomenon takes place called generally the Pfeifer phenomenon and you can study the effects of that phenomenon by removing a drop or two from the peritoneal cavity of the guinea-pig at intervals of a few minutes, as the whole process is completed in twenty to thirty minutes and you will find that immediately after the introduction the cholera bacilli lose their motility, tend to clump together to some extent and quickly break up into granules, no longer recognizable as bacilli, and this is spoken of as a solution of the organisms. No antiseptic we are familiar with is so powerful as that, for within a few minutes they disappear.

Now if you introduce the cholera culture into the peritoneal cavity of the normal guinea-pig no such phenomenon occurs. The bacilli multiply rapidly, and the animal dies of experimental cholera. That is called the phenomenon of Pfeifer, or the Lyso-genic or bacteriolytic phenomenon and the substance producing it is called lysin, so we have lysins as we have antitoxines.

Pfeifer's conception of this is that the peculiar substance exists in a negative state in the blood, and that it is rendered active when there is a demand for it, and further that it can be rendered active by a combination of the negative serum with some fresh serum. If in a test tube you take the protective serum, heat it to 55 degrees to render it negative, add to that a little fresh serum and then the bacteria, the reaction will occur. Two substances are needed then, one the specific substance, and the other some substance in the fresh serum. Erlich applies his doctrine to this also, but it is rather more difficult to understand. The main points are these. He supposes that the lysin is produced in the cells of the body just as the antitoxine substances are produced, but that it has two kinds of affinity: it unites on the one hand with the specific organism that produces the disease, and on the other, with a ferment, or alexine, which is normally present in the blood. This double affinity then is brought in to explain the bactericidal form of immunity.

Those are two of the most important contributions to the

subject of immunity, and in conclusion I would like to say a few words as to the practical application of these points.

We have in the first place the prevention of small-pox by the vaccine virus, that is, an active immunity, of course. In all probability vaccinia is a modified form of the small-pox virus, and the immunity depends upon the introduction of the living organism and its reaction. The individual is left with an active immunity, and as General Sternberg has shown, the blood of that individual is able to render the poison inert.

Then we have in the treatment of rabies another instance of active immunity, having nothing whatever to do with serum therapy or passive immunity. Its prolonged period of incubation after the bite gives time to immunize. Sometimes the symptoms come on before the immunity is fully established, and then of course the treatment is a failure. In all probability it is possible to immunize from cholera, typhoid fever and plague. In the latter case it has been carried on upon a large scale in India, and there seems to be evidence that this active immunization from plague is quite effective, and the scientific men who have gone to India have, to a considerable extent, so far as I can learn, immunized themselves to the disease. Hoffkine is also using the killed cultures of cholera to prevent that disease. There is no danger, of course, of cholera being produced from the killed culture. I suppose there is not much reason to question that in that way human beings can be rendered more or less insusceptible to cholera, and if there had been any occasion, as there came near being during our late war, to vaccinate against typhoid fever, it might have been done.

Now as regards the application of passive immunity, which perhaps interests practitioners more than what I have been speaking of. Of these the only one thoroughly established and about which we are capable of judging from full information is the diphtheria antitoxine. The tetanus antitoxine is a strong serum, but we cannot recognize tetanus in the human being until a large amount of the poison has combined with the nerve cells and so much damage is done that the antitoxine which only neutralizes the toxine is not able to offer hopeful prospects. The method of treatment offers some chance, but on the whole the evidence is rather discouraging as to the antitoxine treatment of tetanus. The later statistics, however, as we secure stronger and stronger toxines, are growing better. The treatment of snake-bite by antivenine is based upon scientific principles, and is working well in India. In antityphoid serum, etc., we have little healing but marked preventive powers. It is rather extraordinary that the antistreptococcus serum should have gotten into such vogue, for the question is still an open one, and it has been found that there is no guarantee that it is

antidotol to any streptococcus except the particular one that has produced the antitoxine. There are streptococci and streptococci and they differ widely in their properties, so that the one you may have to deal with in a case of meningitis or of child-bed fever, etc., may not be identical with the one used to produce the serum, and if not, it is not neutralized. So the bacteriologists are in a state of great scepticism as to the value of that serum, and I think such serum should not be introduced into general practice until there is a good experimental basis to authorize it.

COCCIDIOSIS IN LIVER OF RABBIT.

BY DRS. H. B. ANDERSON AND PAGE.

Coccidia occur very frequently in the lower animals, especially the rabbit, and produce their effects in the liver, intestine and urinary organs. In man their occurrence has been noted in but few cases, and takes the form of a general and local infection. The coccidia invade the epithelial lining of the ducts, or mucous surfaces, and the skin, and from thence they may be enabled to enter the connective tissue by means of the lymph or blood-vessels, and so become generally disseminated.

The disease, as it appears in the liver of the rabbit, may be seen to occur in whitish nodules, varying much in both number and size. Their occurrence in large numbers is very frequent, and their dimensions may range from that of a pin's head to a hazel-nut. When these nodules are cut into, a semi-transparent, yellowish-white, almost caseous material escapes, which consists of debris and a great multitude of coccidia. The coccidium oviforme, as seen in the cysts, occurs in two forms: a round, granular, protoplasmic mass, varying in size, and an oval encapsuled body containing more or less granular material, which only partly fills up the space with the membrane. Those which may be presumed to be the less mature forms, are round, granular, possessing often a nuclear appearance within them. Of the younger forms most of them exhibit many peripheral, deeply staining granules, arranged apparently about the circumference of the coccidium. The more mature forms possess a capsule, and are clear oval bodies, showing a double contour under the microscope.

R. Pfeiffer maintains that these young protoplasmic, non-encapsuled coccidia may split up within the lumen of the bile-ducts into many "sickle-shaped" bodies, and so propagate themselves. With the encysted forms, however, before they multiply it would seem that they must pass from the body of their host, for their further development cannot be traced in

the liver. Some believe that the capsule must be digested off by the gastric juice and the psorosperms set free. At any rate, if placed in water at 37° C. or at the room-temperature, in the former instance in twenty-four hours, in the latter within a few weeks, the granular mass in the cells may be seen to undergo a change, resulting in its division into four sporocysts or sporoblasts. These sporocysts or psorosperms become enclosed within a thin, delicate membrane, and within their substance is developed a crescentic rod nobby at one extremity.

The lesions due to these coccidia occur in the bile-ducts, and consist in the production of a cystic condition, while from the cyst walls may be seen the most beautiful papillomatous growths. The walls of the older ducts may become eventually transformed into an almost non-recognizable cicatricial tissue.

In the specimen presented the bile-ducts may be seen in some cases to be filled with coccidia, the walls presenting beginning papillomatous changes in the form of small projections of connective tissue into the lumen of the already dilated and cystic duct, the projections being knot-like in character and lined with a small amount of delicate epithelium. About the ducts is an increase of connective tissue, which, however, varies in amount at parts. The character of this tissue is such that directly under the epithelial lining many round cells may be seen, but further out it appears much older. At intervals accumulations of round cells in nests may be noticed, as if an irritant were acting at that point. The early stage seems to be an inflammatory condition, which precedes the dilatation and cystic condition. From the walls of the ducts there pass in the lumen many papillomatous growths, which may be seen to branch out in different directions. The connective tissue bearing these growths appears to rapidly assume the characters of fibrous growth. The coccidia within are of a round or oval shape, the latter predominating. Some of these protoplasmic masses were seen to be pear-shaped, the small end of the pear pointing towards the nucleus of the cell near the basement membrane, as if extruding itself from the cell.

What might be taken to be fusions of the papillomatous projections may be seen, for one may grow inwards from either wall, and, meeting in the centre, become intact. Instances were noticed where these growths had met, and the epithelium already destroyed on the extremity of the papilla, presumably by pressure. At other parts it may be seen where three of these projections have grown together and a small triangular area of the duct cut off. These papillæ, or parts of them, may at times become necrotic. Passive congestion is marked in places, and many vessels much engorged.

The demarkation of the connective tissue, surrounding the

bile-ducts, from the liver cells is fairly sharp, with no seeming tendency to produce an inter-cellular increase of connective tissue. In some cases proliferating bile-ducts may be seen in the connective tissue which surrounds a cystic duct.

As a local disease coccidia are met with in man in the genital and intestinal tract, in the liver, and in Davier's and Paget's disease.

Their most interesting relation, however, is the alleged connection with cancer. Concerning this Roncali says, in his paper: "The fortunate contingency that led me to the observation and study of an adeno-carcinoma of the ovary, wherein blastomycetes could be seen in almost numberless quantities, and . . . the morphological analogy of Saufelices, blastomycetes and my own, with cellular inclusions, observed and called coccidia by earlier authors, in the elements of malignant neoplasma of man, are the principal factors that have encouraged me to continue my investigations." He remarks at another place, "that all authors had seen genuine parasites in epitheliomata and sarcomata, but all—with the exception of Russel, Banti and Messer—have been mistaken in assigning to these parasites a place in the animal kingdom." His conclusions are that "as regards the etiology of malignant tumors, both adeno-carcinomata of the ovarian gland, and many sarcomata, as well as the epitheliomata of extremely rapid growth and essentially malignant, are undoubtedly of parasitic origin and are due exclusively to blastomycetic infection." From the adenomatous condition presented in this liver to a malignant form of growth does not seem to be a very great step, but Roswell Park thinks that too much consideration has been given to this.

Clinical Notes.

A CASE OF PYLEPHLEBITIS: LAPAROTOMY, RECOVERY.

DRS. W. H. B. AIKINS AND H. A. BRUCE.

The patient, E. D., aged 24, male, came into the Toronto General Hospital on the 12th of September, 1898. He had severe chills for some days, and, on admission, complained of cramps in his stomach and pain in the region of the liver. Nothing of importance noted in his family history. He has suffered greatly from constipation. Uses alcohol moderately; has never had gonorrhoea. At ten years of age he had diphtheria, and has not been confined to his bed since. There is nothing present to indicate that the patient has ever had syphilis.

Present illness.—During the past summer the patient worked in a basement where he constantly inhaled foul odors, emanating from a filthy well. He has not felt well for three months, but did not stop work until two weeks ago. During this time he has had severe headaches, pain in the stomach, severe chills, followed by fever and perspiration, insomnia, vomiting.

Condition on admission.—Anemic, but apparently well nourished. The conjunctiva slightly icteric; tongue thickly coated in the centre, clean at the edges.

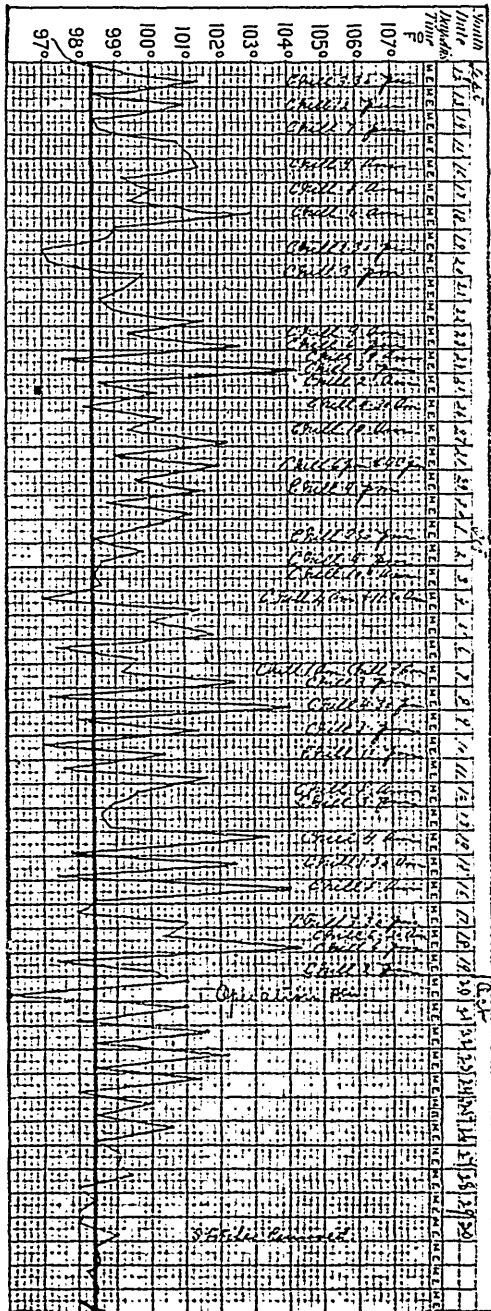
Abdomen.—Prominence on the right side, in hepatic region. The liver is very considerably enlarged; the lower margin can be felt two or three inches below the ribs; the upper limit of liver dulness being normal. The spleen is very slightly enlarged.

Respiratory system.—Has a slight cough and expectoration. No tubercle bacilli found in the sputum. Nothing abnormal found in the lungs. Nothing abnormal found in the circulatory, nervous, osseous, or genito-urinary systems. Urine sp. gr. 1020; acid, no albumen, no bile salts, no bile pigments, no puss, no sugar, some triple phosphates.

Blood examination.—Widal reaction tried with a negative result. The plasmodium malariae not found. Hemoglobin, 54 per cent.; red blood corpuscles, 3,600,000; white, 12,000. It will be seen by the accompanying chart, that the patient has one and sometimes two chills daily, and that there is no regularity as to the time of their occurrence. The difference between the maximum and minimum temperature on October 9th was

seven degrees. On October 13th some blood was taken for bacteriological examination. An organism was found which grew very slowly on the media, which turned out to be the streptococcus pyogenes.

As his condition did not improve under medical treatment, on October 17th consultation was held and an exploratory incision decided upon. On October 20th (the operation was performed by Dr. Bruce, assisted by Dr. Adam Wright) an incision was made parallel with the lower costal margin on the right side, and two inches below it. On account of the great size of the liver, it was impossible to properly explore the interior of the abdomen until another incision was made joining the former one at right angles, about its middle. The liver was found to be greatly enlarged and congested. Patches of lymph were present on the upper surface. An aspirating needle was introduced into the liver in several places, but nothing came away except a little blood. No pus was



found anywhere. The gall-bladder and bile-ducts were examined, and appeared to be quite normal. The cæcum and appendix vermiformis were examined and were in a healthy condition.

The stomach was carefully gone over, and nothing abnormal found. The kidneys, spleen and pancreas were palpated, and showed no evidence of disease. The abdominal wound was closed. A chill occurred as soon as the patient was taken back to the ward, but there has been no return of chills. The wound healed by first intention, and the patient made an uninterrupted recovery. He left the hospital five weeks after the operation, apparently quite well.

The liver, however, has only slightly diminished in size. The patient is now working in a factory doing very laborious work, and feeling in the best of health. The liver is still enlarged, but its lower margin is only one inch below the border of the ribs.

One cannot feel absolutely sure of the diagnosis, but the condition seems more like pylephlebitis than anything else. Mr. Frederick Treves reports a case of pylephlebitis, in which he did an exploratory operation, the patient ultimately recovering. In his case he could see small, yellow points of suppuration all over the liver.

(Reported by Dr. Stewart, of the Resident Staff, Toronto General Hospital.)

CASES IN PRACTICE.

BY J. W. McINTOSH, B.A., M.B., MANTOWANING, ONT.

Pernicious Anæmia.

Female, aged 31. Family history: Four sisters, all said to be more or less anemic (simple). Personal history: Married nine years. First child died at fourteen months, then six successive miscarriages. For some years appeared anemic, but apparently quite well, except history of an attack apparently somewhat similar some three years previously. About 1st January last, threatened miscarriage at eight months; with rest and sedatives continued to full term. Positively no specific history in self or husband. 30th January healthy child born; labor normal—lasted twelve hours—not severe. No post-partem hemorrhage, no rise of temperature. Secundines normal in appearance but rather scanty. Patient got up tenth day, but weak and anemic in appearance. Put on tonics and hematinics—strychnine, peptonate of iron and manganese, cod liver oil emulsion with hypophosphites of lime and soda; but instead of strength increasing and anemia improving, got progressively worse, requir-

ing to rest several times whilst dressing owing to faintness and breathlessness. Small ulcers appeared on the tongue and buccal mucous membrane. Baby weaned. Rest, nourishment, tonics, hematinics, hygienic surroundings of no avail. Steady increase of anemia, weakness and breathlessness on exertion. 19th February—suspected pernicious anemia. Microscopical examination of blood confirmed diagnosis. The condition at this time was as follows:

Symptoms and signs: Countenance pale and of characteristic lemon tint. Skin dry and bloodless, no edema, sclerotics pearly. Tissues not emaciated but muscles soft and flabby to the last. Lips and gums bloodless. Tongue clean but flabby and anemic. Small ulcers on tongue and buccal mucous membrane, not healing with chlorate of potash or silver nitrate. Appetite none. Gastro-intestinal dyspepsia, later on with slight nausea, then vomiting, which became uncontrollable until the stomach was given absolutely no food. Vomit composed of large quantities of bile green in color (showing lodgment in stomach long enough for oxidation by gastric secretion) and giving reaction for biliverdin. Liver enlarged, with slight tenderness over that region. Spleen and other abdominal organs apparently normal. Bowels constipated, but acted much more freely after purgative than was their wont during health. Respiratory organs normal, except for intercurrent bronchitis.

Cardio-vascular system: Cardiac dilatation, hemic murmurs in mitral, pulmonary and aortic areas. Arteries in the neck pulsate visibly, pulse soft and compressible, but rather full. Superficial veins somewhat prominent. Slight hemorrhages from nasal mucous membrane. Patient languid, with marked faintness and breathlessness on exertion. Urine, sp. gr. 1010–1015, light in color, but no urobilin reaction elicited. Fever, temperature ranged from 99° F. to 102.4° F.

Nervous system: Numbness in arms, chest and legs, tingling and pruritis general. The blood—microscopical examination showed red corpuscles enormously diminished, individual cells abnormally rich in hemoglobin and showing megalocytes and microcytes. Poikilocytosis marked—one form nucleated; numerous leucocytes diminished in numbers. Platelets, none showed. Numerous nucleated red corpuscles, gigantoblasts forming the great majority. After the course in arsenic there was an increase in the number of red corpuscles from $\frac{1}{2}$ million per c. cm. to $\frac{3}{4}$ million.

Treatment adopted: Tonics, hematinics, rest in bed, and hygienic attention to person and surroundings failed to bring about improvement; otherwise symptomatic. Disease rapidly progressive. Turned to Fowler's solution, initial dose 3 minims,

increased to 9 minims three times a day—temporary improvement. Gastric and bronchial symptoms intervened and patient relapsed; stopped Fowler's solution, controlled the above: Gave arsenious acid in triturates. No puffiness of face produced, but vomiting commenced and became almost uncontrollable; stopped arsenic. Transfusion considered, but rejected owing to apparent hepatic hemolysis. Patient died on 27th March, eight weeks after onset. *Post-mortem* examination could not be secured.

Points of Interest.—Failure of iron, temporary improvement under arsenic. Gastric disturbances requiring cessation of arsenic and exclusive use of nutrient enemata for nourishment. Predigested proteids were found most suitable both per os and per rectum. Hunter's idea *re* farinaceous food did not agree in this case. The temporary hemogenesis under arsenic and marked evidences of hepatic hemolysis from the congestion and enlargement of that organ and from the large quantities of biliverdin in the very copious vomited matter and the dark bile-stained feces. The rapid course—less than two months. The intercurrent bronchitis. The history of a probable previous attack. The persistent rise of temperature above normal, which was most of the time between 100° F. and 101° F.

Acute Infective Endocarditis with Embolism in *Cardiadextra Congenitalis*.

On the evening of 11th February last, I was called in consultation with attending physician to see A. B., male, aged 18, at Providence Bay, thirty miles distant—supposed to be suffering from la grippe, malposition of heart not having been recognized. Family history good, parents and nine brothers all being in good health. Personal history: Previous health good till a few months ago, since which time his strength did not warrant hard work, but otherwise well. Cardiac dilatation may have commenced then. History of onset imperfect, but I learned that about ten days previously, he took ill with pain in the chest, chills, fever, accelerated pulse, occasional palpitation of the heart, progressive weakness and delirium. Coma ensued some twenty-four hours previous to my visit.

Condition on examination: Light coma. Tongue coated. Examination of abdominal organs revealed nothing abnormal in position or condition. Constipation. Urine febrile. Lungs apparently all right. Pulse 118, weak. Temperature 102.8° F. per rectum.

Cardiadextra: Apex beat felt in right fifth intercostal space, about an inch from the sternum. Heart enlarged, area of absolute cardiac dulness circular and about 1½ inches in diameter. Distinct systolic bruit heard at the apex.

Diagnosis: Congenital cardiadextra. Acute attack of infective endocarditis, with cardiac dilatation and embolism in central nervous system producing coma.

Patient died a few days later. Unfortunately, owing to the distance, I was unable to secure *post-mortem* examination.

Persistent Thyro-Glossal Duct (?)

On October 12th, 1898, whilst on a professional visit to Killarney, twenty-five miles distant, I was called in to see a female, aged 21, with enlarged thyroid gland. For some months she had complained of an offensive discharge coming into her throat, without vomiting, without coughing, and with no accompanying catarrh, becoming quite profuse at times, on which occasions she noticed a diminution in the size of the goitre. There was no history of an abscess with sudden rupture into the trachea. Firm compression on the gland produced such discharge in the throat with apparent diminution in the size of the isthmus, or middle lobe of the thyroid. Patient said it had resisted medical treatment for some months. I asked her to come to my surgery here for further examination and treatment, but in the meantime placed her on inunctions of lanolin and iodoform. About two weeks later, word came that this had completely cured the offensive discharge; but as to the size of the goitre I did not hear. A future laryngeal examination might reveal a secretion into the foramen cecum, which would be of interest, as the late Professor Kanthack (*Journal of Anatomy and Physiology*, vol. xxv., p. 155) found no trace of such a duct in one hundred adults examined.

The Canada Lancet announces in its May issue, that Dr. H. B. Anderson will become its editor when he returns from Europe next autumn.

A number of surgeons of Toronto and vicinity left their homes, May 28th and 29th, to attend the annual meeting of the American Railway Surgeons at Richmond, Virginia. Among them were Dr. Bruce L. Riordan, who was elected President at the meeting held last year in Toronto, Drs. Herbert Bruce, J. Noble, W. H. Pepler, and Thos. Mackenzie.

Dr. J. Price-Brown will attend the meeting of the American Laryngological, Rhinological and Otological Society in Cincinnati on the 2nd and 3rd of June.

Society Reports.

TORONTO PATHOLOGICAL SOCIETY.

The regular monthly meeting of the Toronto Pathological Society was held on April 29th, Dr. Primrose in the chair. Present: H. B. Anderson, Bruce, Greig, Silverthorn, Hamilton, Wm. Oldright, H. H. Oldright, Rudolf, Peters, Amyot, Carveth, E. E. King, R. A. Reeve, I. H. Cameron, C. J. O. Hastings, J. J. Mackenzie. As visitors there were present Drs. J. O. Malloch, King Smith, C. A. Page, Wm. Goldie and Messrs. P. L. Scott and Coutts.

Case of Carcinosis.

Dr. Amyot: Male, aged 66. Had small-pox and malaria forty years ago. Five months before death was struck on the lower jaw with a piece of wood. Shortly afterwards a small tumor was noticed at seat of injury. This increased in size until it extended up the ramus of the jaw, to the steno-mastoid muscle and the tissues in the neighborhood, forming quite a large mass. This softened, pointed, discharged and diminished much in size, so that at time of death there was only a slight enlargement. Heart beats became very irregular, both as to rhythm and force.

Post-mortem.—Emaciation. No pigmentation. Over chest, abdomen and back about thirty to forty nodules from the size of a split pea to that of an ordinary white bean were to be seen to the square foot, some movable under the skin, others quite attached to the skin. The number of these nodules gradually diminished on the thighs to the knees (there were only two below, and these just immediately below). The same on the arms to the elbows, below which there was but one and that just below the joint. The same kind of nodules were to be found on the head, neck, face and scalp—edema of the glottis. Pleural cavities of both sides obliterated. Nodules scattered throughout its substance. Remarkably few nodules in either lung. Counted on the surface of the heart sixty-seven growths. There are some projecting into the interior of the heart as well. A continuous row of nodules along the thoracic duct. In the abdomen the peritoneum is literally sown with them, even over the intestinal surface. The liver has them thickly scattered throughout its substance. Spleen and kidneys free, supra-

renals both much infiltrated. Microscopically it is an adenocarcinoma, with extremely small alveoli, and small, irregular cells. It would be difficult to make out a parent for this growth with any normal gland.

The remarkable points with reference to this case are:

1. The surface distribution of the nodules, not below the knees, not below the elbows. If it was a dissemination by the blood stream, it would most likely have extended even to the feet and hands.
2. Then, again, the pleura invaded, with only a nodule here and there in the lung, as though it had again been invaded by the lymphatics (though of course, carcinoma does go up stream, too, in the lymphatics).
3. Then the remarkable condition in the heart. One fairly frequently finds a nodule or two in the heart. Here there are sixty-seven on the outer surface alone; almost no invasion of the lung, and still this extreme invasion of the heart. I think we do not often think of the heart having such a free supply of lymphatics.
4. Again, the spleen and kidneys all free of nodules: the supra-renals, the intestines, the peritoneum and the liver full. Here is an example of up-stream invasion and evidence that the dissemination was not by the blood vessels.

Dr. Amyot's paper was extremely interesting, as were the specimens. He was of the opinion that the lymphatics and not the blood vessels were the channel of dissemination. Discussion was shared in by Drs. Wm. Oldright, Rudolf and Fotheringham.

Carcinoma of Leg.

Dr. Amyot: Female, aged 60; commenced seven years ago as a thick scaly patch, then ulcerated after a couple of years. This gradually grew larger, until, as you see, the specimen now is $2\frac{1}{2}$ x 4 inches long axis with the leg. Fetid discharge. Growth overhangs normal tissue, does not invade it, but seems to be present (the cancer) in the connective tissue of ulcer. In early stages the ulcer looked like an ordinary ulcer. It is a squamous-celled epithelioma.

Carcinoma of Esophagus.

Dr. Peters presented a case on the above from a man aged about sixty-seven. The history extended over a period of about six months. The principal symptom was the production of a violent spasmodic cough on any attempt to swallow fluids. A laryngoscopic examination by Dr. J. D. Thorburn excluded tubercular, syphilitic and simple inflammatory disease of the larynx, and there were no symptoms of aneurysm. Solid food could be swallowed more easily than liquids, and an esophageal bougie could be with ease passed into the stomach. During

the passage of the bougie the patient complained of pain about opposite the manubrium of the sternum, the region afterwards found to be the seat of the cancer. The patient died after two days' acute illness from septic pneumonia. On *post-mortem* examination a squamous-celled epithelioma of the esophagus was found opposite the bifurcation of the trachea. A perforation admitting a No. 6 catheter had taken place into the trachea, through which the food passed in the act of swallowing, thus producing the spasmodic cough and ultimately leading to septic pneumonia.

Microscopic examination revealed squamous-celled epithelioma with typical cell nests, shaggy ulcerating growth in middle of esophagus opposite the bifurcation of the trachea, which it here perforated, allowing food material to pass in. This has been distributed over both lungs, setting up pneumonia. It is patchy in character. Pleura have both lost their gloss. There is a post-pleural abscess $1\frac{1}{2}$ by $3\frac{1}{2}$ inches, extending up the spine to the neck. There is very little enlargement of the neighboring lymphatic glands. Microscopically it is a good example of a squamous-celled epithelioma. The pneumonia shows a red and a grey stage, and remarkably the neighboring lymph glands show no carcinoma.

A Series of Appendices.

A series of appendices was presented by Dr. Peters, followed by others from Drs. E. E. King and H. A. Bruce.

Dr. Peters presented a series of four appendices removed by operation.

CASE 1.—The first was from a recurrent case of some ten years' standing. It gave rise to attacks of appendicular colic of disabling severity. Some of the attacks were associated with inflammatory symptoms and localized tenderness. Some thickening could be felt through the abdominal wall, which was very thin. On section the appendix was found to be bound in by extremely dense cicatricial adhesions, and occupied a position upwards and inwards towards the umbilicus but behind the lower end of the ileum. On dissecting it out of this bed a foreign body (fecal concretion) about $\frac{3}{4}$ inch in length was found. The whole length of the organ was about $2\frac{1}{2}$ inches.

CASE 2.—This organ also contained a fecal concretion about $\frac{3}{8}$ inch long, situated about $\frac{1}{2}$ inch from the cecal opening. About $\frac{1}{2}$ inch to the distal side of this concretion was a gangrenous patch, in the centre of which was a small perforation. This had given rise to a diffused purulent peritonitis. Although it is a rule in treatment not to attempt removal of the appendix when it is surrounded by an abscess

cavity, this rule may be disregarded with advantage to the patient when a foreign body is found in its cavity. Otherwise, although the perforation may heal by granulation, the foreign body which is left is very likely to set up subsequent attacks any one of which may terminate fatally.

CASE 3.—This presents a very small perforation in the centre of an ulcerated area about $\frac{3}{8}$ inch in length on the lateral aspect of the organ. The remainder of the mucous membrane was quite healthy and no foreign body was present. There was no evidence of disease of the neighboring cecum or ileum, and no history of tuberculosis or typhoid fever could be obtained.

CASE 4 was a case of catarrhal appendicitis with great general thickening of the whole organ, and a small perforation had occurred about half-way between the base of the appendix and its tip. There was very great thickening of the mesentery, with fatty infiltration.

Dr. E. E. King, in presenting his specimen of appendix gave the following details of the case:

The case was operated on during the attack. The patient had thirteen or fourteen previous attacks. He had refused previous operation but consented reluctantly. The intestines were matted into a large mass involving the appendix. The mass of intestine had to be dissected, and about half drachm of pus was evacuated. It was with great difficulty that the appendix was removed and the first ligature cut through, and no other precaution than simple ligation was applied. The recovery was uninterrupted and the temperature did not rise above 99.2.

Dr. Bruce, in presenting his specimen of appendix, remarked upon the following special features of the case: The patient, a boy of fourteen, had never had an attack before, and this lasted just seventy-two hours. There was only about half an ounce of pus; a small elongated fecal concretion was found. The appendix was about one inch in length and perforated about three-quarters of an inch from its tip. A mass of omentum completely surrounded the appendix. The general peritoneal cavity was shut off by adhesions between omentum and parietal peritoneum.

This series was discussed by Dr. Wm. Oldright, who expected to have presented two appendices removed during this month and which would have been a contrast to those shown to-night, the pathological condition being in inverse proportion to the clinical symptoms. In both these cases the attacks had been frequent and severe, and yet nothing but constrictions in the lumen were found, the operation in each case being between attacks. Dr. Oldright wished to know whether the fecal concretions observed by others were found caminated. He thought

the formation was generally by repeated coatings of fecal matter upon a small nucleus. This was so in those they had met with. He also wished to hear the observations of others as to the proportion of cases where appendicitis had only occurred once in the same patient without recurrence, even when sufficient time had elapsed for recurrence, this being a point of great importance in practice.

Drs. Rudolf and Anderson discussed specially the action of the omentum in assisting the walling-off process in appendiceal abscess. Dr. Anderson referred also to two cases he had seen this year of left-sided femoral phlebitis following successful and aseptic operation for removal of appendix.

Dr. Peters, in replying, said that in his opinion the position of the omentum in appendicitis was determined by the position of the appendix. If the latter be placed downwards or backwards from its usual site, the omentum can hardly reach it.

Epiphysis of Co Calcis Separated by Osteomyelitis.

By Dr. Peters.

Dr. Primrose, discussing Dr. Peters' paper on epiphysis by osteomyelitis, pointed out the great readiness with which the periosteum of the shaft of the bone in a child can be stripped off, even by an injection beneath it, up to the epiphyseal cartilage, from which point to the joint the periosteum clings to the epiphysis so firmly as to tear it away with it if sufficient force be applied.

Cœur Biloculaire.

By Dr. Rudolf.

Dr. Cameron, discussing Dr. Rudolf's paper on cœur biloculaire, elicited the fact that recent investigations, particularly by His, Kokitansky, and Peacock, upon the development of the human heart, have quite upset the teachings derived from the study of the heart of the chick, and placed the embryology of the heart upon a different basis.

Coccidiosis in Liver of Rabbit.

By Drs. Anderson and Page. (See page 318.)

It was moved by Dr. Fotheringham, seconded by Dr. Oldright, that the rest of the programme be taken as read, that nominations might be received for officers for the coming year.

The President then declared the meeting adjourned.

TORONTO CLINICAL SOCIETY.

The fifty-fourth regular meeting of the above society was held in St. George's Hall, Elm Street, on Wednesday evening, May 10th, at 8.30 p.m. The President, Dr. F. LeM. Grasett, occupied the chair. Fellows present: Drs. J. A. Temple, E. E. King, Ryerson, H. J. Hamilton, McIlwraith, Bruce, Boyd, Primrose, Small, William Oldright, Lehman, Peters, Badgerow, Thistle, Britton, Macdonald, Bingham, Fenton, Greig, Pepler and George Elliott.

In connection with the adjourned discussion on severe injuries and crushes involving the question of amputation, Dr. E. E. King showed two cases of injury of the foot and hand respectively, both street-car accidents, in both of which nature had effected the cure. Dr. William Oldright also showed a case of injury involving the question of conservative surgery, and described the conditions present.

Dr. Primrose introduced a patient, a woman, whom he had seen for the first time on Christmas morning, 1898. She had fallen on her outstretched hand on a piece of crockeryware. The flexors sublimus and profundus of both index and little fingers were completely severed. The superficial palmar arch was torn with much bleeding, and the cut was carried down to the metacarpal bones. The tendons were sutured with difficulty owing to the retraction, kangaroo tendon being employed. A drain was put in the outer angle of the wound, and it healed without suppuration, although there was a good deal of dirt in the wound at the time of the injury. The nerve passing to the index finger was sutured, but he could not secure the other nerves. The patient has sensation in that finger.

Drs. Peters, E. E. King and Oldright continued the discussion of the several cases presented.

Un-United Fracture.

The subject of this case was a young lad of fourteen years. He was seen first by Dr. Temple on October 31st, 1898, for an alleged dislocation of the right shoulder, which had occurred five weeks previous to the time he was first seen by Dr. Temple. The injury was received in a football game. He was thrown violently to the ground, and received an injury of the upper part of the right shoulder. He was seen shortly afterwards by a physician, and the diagnosis then was dislocation of the right shoulder. The arm was then put up in splits with the arm close to the body, and strapped across it. The boy was kept in that attitude for four or five weeks, during which time he suffered from a great deal of pain. When Dr. Temple saw him

the arm was still in a sling, and when taken down it hung alongside his body. He could not raise it from the side of his body, but he could take hold of it with the other hand and lift it up. On examining the arm Dr. Temple felt quite satisfied it was not a fracture dislocation but an un-united fracture. The boy was fairly stout, but you could feel very distinctly that the lower part was very near the surface. The jagged end of the bone almost protruded through the skin. He thought he could make out that the head of the bone was in its proper position. The lower fragment laid outside the upper one. He felt quite satisfied a fracture existed, and that it was not a case of dislocation. Dr. King has made skiagraphs of the case, which show clearly the nature of the accident. (Two skiagraphs here exhibited.) In the first one, looking at the arm from behind, you can see the outline of the scapula. Beautifully, the lower fragment lying outside the upper. In the other, the front view was very satisfactory. Drs. Cameron and Grasett saw the case in consultation. The treatment proposed was to try under chloroform to reduce the fracture, but it was absolutely impossible to dislodge the fracture. It could not be brought down although two surgeons pulled at either end. Dr. Grasett made an incision, but he could not dislodge the fracture even then. After breaking down the fibrous union it could not be done. We then removed a piece from the lower fragment and brought the ends into very fair apposition. The bones were not wired. We put the arm up in an extended condition, out from the body with a rectangular splint, along the outer side and up over the shoulder, and another one on the inside making extension. He was kept in that position for a week or two, and then Dr. King made a second skiagraph, about ten days after the operation. This shows the arm, looking at it from the anterior surface, and you will see the bones are in position. We got the bones as normal in shape as we possibly could, but not completely plump together. For a period of six weeks, the part was not disturbed; then the splints were taken off and the injured boy has the most complete use of his whole arm. He can play hockey, baseball, etc., and has complete movements. The result has been most gratifying without wiring. Dr. Temple asked for an expression of opinion from the Fellows regarding the treatment of these cases.

Dr. Grasett—When we made that incision and tried our very best, even using levers to throw the lower fragment in, we could not do it. We then took off half an inch of the lower fragment and then it came together comparatively readily. He further stated that Dr. Cameron thought there was no occasion to wire. He had treated these cases, sometimes wiring and sometimes not.

Dr. Peters discussed the case at some length. He did not think the case one of un-united fracture, and could not see why it should be called such. Any other treatment than opening up the parts would not have resulted so well.

Drs. Primrose, Oldright, E. E. King and Britton continued the discussion for some length of time, instancing similar cases seen in their own practices.

Dr. A. A. Macdonald spoke in reference to the use of sere in cases where the fracture was oblique.

Dr. A. A. Macdonald showed an appendix removed from a scrofulous lad, who had been the subject of two or three previous attacks of appendicitis with a good deal of pain in the region of the appendix.

2. A specimen of cystic ovary somewhat bound down, occurring in a woman who was insane. The irritation of the ovary, he thought, had something to do with the mental condition.

3. A specimen of fibroid tumor of the uterus, growing sub-peritoneally from the upper part of the fundus. This he enucleated, tying off the vessels.

4. A specimen of a sub-mucous fibroid from the interior of the uterus. The woman from whom Dr. Temple and he himself had removed this, was suffering from an ovarian cyst. The peculiar condition was not recognized before, owing to the hardness in the vicinity. It was not recognized until the patient was on the table.

Election of Executive Committee.—The following Fellows were elected the Executive Committee for 1899-1900: H. B. Anderson, H. A. Bruce, G. Silverthorn, George W. Badgerow, George A. Peters.

GEORGE ELLIOTT,
Recording Secretary.

Editorials.

CLINICAL VS. DIDACTIC TEACHING.

The methods of teaching in our medical colleges have been much improved in recent years. It is generally recognized that modern methods are more satisfactory than those that formerly prevailed. There is probably one exception to this general statement. We have nothing now similar to the old apprentice system, and that is, in some respects, unfortunate.

One of the questions which repeatedly comes up is now being discussed in the medical journals of the United States, *i.e.*, the question as to the relative merits of didactic and clinical teaching. From an article in *Medicine* (Dr. Moyer's medical journal) we learn that the editor of the *Philadelphia Medical Journal* has expressed the view that didactic teaching is quite useless, while Hirst and Hare on the other hand hold a contrary opinion.

In Canada the leading teachers of medicine are generally agreed that in former times we had too much didactic and too little clinical teaching, but we don't know that many, if any, will go so far as to say that didactic teaching should be abolished. A great deal depends on the character of the teachers. As a matter of fact some of the most learned physicians are poor teachers. A didactic lecture from one of the latter is generally absolutely useless for the average student, while a clinical lecture is often but little better.

Often, as pointed out by many, the so-called clinical lecture is little other than a didactic with a patient to look at. The best sort of teaching is probably that which is known as bedside teaching to small classes, and yet a didactic lecture may be delivered even at the bedside.

In the article referred to we find the following sentences (which we fully endorse) as to the qualities of successful teachers: "The true teacher is born, not made; he must possess that indefinable quality which enables him successfully to impart knowledge to others. If he have this, and with it enthusiasm, learning and knowledge, then he will instinctively choose the most appropriate means of imparting knowledge to his pupils."

TYPHOID FEVER IN LONDON HOSPITALS.

A representative of the *British Medical Journal* has been making certain inquiries respecting the regulations under which patients with typhoid fever are received into the general hospitals of London, and has received replies from the staff of seven of these. From the information it seems likely that every general hospital in that city admits typhoid patients into its public wards, but the proportion of such cases is generally either directly or indirectly limited for two reasons, viz., (1) The risk of infecting other patients, and (2) the increased strain on the nursing staff. It is generally considered that the stringent precautions adopted in the various institutions are sufficient to prevent any danger from infection. It is also generally believed that typhoid fever requires, as a rule, more time and attention on the part of the nurses than any other disease.

The proportionate numbers of cases which may be admitted to the various hospitals are approximately as follows: King's College, St. Bartholomew's and St. Thomas's Hospitals, 1 to 6; Guy's Hospital, 1 to 10; London Hospital, 2 to 9; Charing Cross Hospital, 6 to 22; University College Hospital, 3 to 16. With regard to the amount of cubic space allowed to each patient, St. Bartholomew's and King's College did not answer definitely, but simply stated that the typhoid patients were allowed the same space as those suffering from other diseases. At other hospitals the figures were for each patient: Charing Cross, 1,000 feet; University, 1,140; London, 1,348; Guy's and St. Thomas's, 1,800 each. The cubic space in certain hospitals thus appears to be remarkably small, but the *Journal* states that most if not all the authorities in the hospitals quite appreciate that fact.

THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

The new School of Tropical Medicine established in the Royal Southern Hospital, of Liverpool, England, was inaugurated by Lord Lister, April 22nd, 1899. A ward containing twelve beds has been set apart for the reception of patients suffering from tropical diseases, and two adjacent rooms have been fitted as

ward laboratories, with the most recent appliances. At the opening ceremony, the chairman pointed out (*British Medical Journal*) that, since the hospital had been opened, fifty-seven years ago, the wards had never been free from cases of tropical diseases. Its proximity to the docks was probably the chief reason why patients were carried there. The ward was at present full, and the twelve patients represented the nationalities of China, India, the United States, Norway, Sweden, Russia, Finland, England, and Ireland; and the diseases were contracted in Java, India, Brazil, Savannah, South Carolina, Benin, and Cape Coast Castle.

Lord Lister formally declared the ward and laboratories open, and said that Liverpool in this matter was doing what was of the greatest importance for the welfare of mankind. He also thought that the hospital and the school committee were to be congratulated on having obtained the services of so distinguished a man in these tropical diseases as Major Ross, whose observations had been of the highest importance. Every week or two they saw evidence and confirmation of the accuracy of his work, the recognition of which came from Germany, and from France, and in fact from everywhere. It was most fortunate that they were able to obtain a man of such distinction, of such competence as an observer, and one having had so much experience in tropical diseases, to be the medical officer; and also to be able to associate the school with the great college, of the pathological department of which Professor Boyce was the head. It was a double security that everything would be done to the best advantage.

ONTARIO MEDICAL LIBRARY ASSOCIATION.

In order to enable this Association to keep up with the times an "Endowment Fund" was established some months ago for the prompt purchase of the new publications as issued. As the interest alone can be used, and as the fund is only in its infancy, very little money is as yet available. It is hoped, therefore, that a generous response will be made to this fund by many of the profession who will not miss a small contribution in so good a cause.

Many may not feel justified, for one reason or another, in giving to this fund; but we are all able to help the Library in another way, and that is by sending all the old journals about the office. These can be utilized in "exchange" with other libraries. All that is necessary is to pack them in a box, address it to the Medical Library, corner Bay and Richmond Streets; freight will be paid on arrival, and an acknowledgment made through this journal.

Books of any date will also be gladly received. They are of some use to the Library; the great majority of old issues are of no use whatever to the regular practitioner except to remind him that he is "getting on in life." Therefore look over the old book-cases, cupboards, store-rooms and out-of-the-way corners, and send on all you do not need.

A cordial invitation is extended to the members of the Ontario Medical Association to visit and make use of the Library in any and every way during the meeting this month.

We have before referred to the generosity of our friend William Osler in offering to present a certain number of volumes each year, for a term of years, in memory of his old teacher, the collection to be called the "Bovell Library." The first instalment was received by the curator about three months ago, and contains many of the latest works on pure medicine-

THE ONTARIO MEDICAL ASSOCIATION.

The nineteenth annual meeting of the Ontario Medical Association will be held June 13th and 14th in Toronto, in the building of the Education Department, St. James' Square, through the kind permission of the Hon. Dr. Ross, Minister of Education. A banquet will be held in the evening of June 13th, at McConkey's restaurant, King Street. The Committee on Arrangements would feel greatly obliged if the members who intend to be present would inform their secretary, Dr. E. H. Stafford, Asylum for Insane, Toronto, as early as possible; tickets, \$2.00 each. Arrangements have been made with the railroads for special rates. Those who wish to take advantage of the reduced rates may do so by buying from the agents at points of departure a single ticket to Toronto, and in addition

obtaining a standard certificate which will be signed by the secretary at the meeting. This certificate thus signed will entitle the holder to his return trip at the reduced rate. No rebate will be granted on a return ticket already purchased.

The following is a synopsis of the provisional programme :

SYNOPSIS OF PROGRAMME.

JUNE 13th.—*Morning Session*—(1) Reports, etc. ; (2) "A Case of Muscular Dystrophy," by Dr. Ingersoll Olmsted, Hamilton ; (3) "Relapse in Typhoid Fever," by Dr. Wilson, Philadelphia ; discussion by Dr. Alexander McPhedran, Dr. J. L. Davison and others.

Afternoon Session—(1) Presidential Address ; (2) "Symposium on Sanitarium Treatment of Tuberculosis," by Dr. Vincent Y. Bowditch, Sharon Sanitarium, Boston. Discussion—"Pathology of Pulmonary Tuberculosis," by Dr. John Caven ; "Earliest Diagnosis and Selection of Cases for Sanitarium Treatment," by Dr. N. A. Powell ; "Home Treatment and Prevention of Tuberculosis," by Dr. T. F. McMahon ; "Care and Prevention," by Dr. Charles Sheard. General discussion will follow.

Evening Session—Association Dinner.

JUNE 14th.—*Morning Session*—Sections, Medical and Surgical.

Afternoon Session—Demonstration of a case of Coccidial Infection with photographs by Dr. D. W. Montgomery. Discussion in Surgery. Dr. Christian Fenger, of Chicago, will open this discussion with a paper on "Diseases of the Kidney Amenable to Surgical Treatment," followed by Dr. Luke Tesky, Dr. John Wishart (London), Dr. R. B. Nevitt, Dr. Grasett, and others.

Evening Session—Business.

The titles of a large number of papers have been received, some of which will be read before the General Session, others in the sections. Papers must be in the hands of the secretary by May 20th. Full discussion of papers is desired. Harold C. Parsons, Secretary, 97 Bloor St. West.

DISPOSAL OF TORONTO'S SEWAGE.

Nature provided Toronto with a beautiful bay, the water as bright and clear as any in the world. The old man eloquent still basks in sunny memories of the primal beauty of the scene, and some of us who cannot lay claim to that appellation, can still remember when we could, without the slightest repugnance, nay, with great gusto, take a plunge from off the lumbermen's rafts and booms at the Northern elevator. It was a pleasure to paddle about the water front of the city itself.

Now the waste of a busy and populous city is cast into the water front. This means from 15,000,000 to 20,000,000 gallons of sewage daily, carrying from 40 to 60 tons of solids—street washings, excreta, offal, and the wastes of our numerous industrial pursuits.

It is still true that Toronto is one of the most beautiful and charming cities in the world, and that it presents in its residential, tree-lined streets, its suburbs, its parks and drives, and its extensive and convenient (though somewhat overcrowded) electric car lines, and its numerous cheap and commodious lake and railway outings, attractions to visitors such as few cities can offer. The quality of the water at the bay front, however, is not a very inviting introduction. It is also true that we can still, by paying a car or boat fare and taking a half-hour's trip, enjoy the *dolce far niente*, stretched on the grass or the sand beside the rippling waters on the far shore of the bay, or the surf-beaten cliffs of Scarborough Heights, or the Garrison Commons, or listening to the splash of the waves on Humber beach or the Island lake front. But we ought to restore to the toiler in the part of the city contiguous to the wharves and slips the privilege of taking his after-tea stroll or rest on the city side of a pretty bay, dotted with all kinds of craft, enjoying the sights presented and breathing the exhilarating air that rises from a clear expanse of water.

What we want to emphasize now is, that all this can be restored if we set about it in real earnest, and we of the medical profession ought to lend a strong helping hand. We do not expect to see all along the front the green slopes that once were. Although we are glad of the promised Lake Street park, it goes without saying that we want to see large warehouses and elevators, tall chimneys, tall masts and steamship funnels, but we would like to be able to stroll or paddle about and admire these with comfort and enjoyment.

At the present time the Medical Health Officer and City Engineer are making efforts towards providing the great remedy. In a future issue we propose to speak about the *materia* [and] *medicamenta* suggested and opinions given in the past, and will be open to suggestions, financial, sanitary or æsthetic. In the meantime we wish to impress upon aldermen and other powers that be the *necessity* of doing something—

doing and not merely spending money in obtaining opinions. We will commence with Dr. Sheard's testimony and will be glad to get that of others. He says :

"There are many conditions within the municipality which require consideration, and which demand an improvement of the general sanitary state. Prominent among these is the adoption of some process for the ultimate disposal of the sewage of the city. Numerous complaints have been made to the Health Department regarding various localities along the water front, and I have during the past year furnished to the Local Board of Health a special report dealing with the entire question, and urging upon the Council the wisdom of deciding upon some definite plan for dealing with the city sewage."

On the necessity, from a financial standpoint, of doing *now* what has to be done, he says :

"It is a matter which cannot be very long delayed. With the improvements shortly to be made in the city's harbor it becomes imperative that some definite plan should be agreed upon. The main obstacle to the carrying out of the work appears to be the expense of it. In a few years the water front will probably be rearranged in accordance with the extension and enlargement of the wharves to the Windmill line. Some of the sewers will be carried southward, and the ground prepared by filling, piling, etc., and great loss will be incurred to the municipality unless it is settled what method is to be adopted to ultimately deal with the sewage of the city of Toronto, and to proceed with the subsequent work relating to the improvement of the water front with due regard thereto."

When we give the history of municipal action in the past it will be seen that our city fathers have not been so negligent of the question as we might think, and that our city officials have long been battling for the right. Tall city towers and ambitious commercial schemes have, however, drained away the sinews of war. Let us now convince the people that the sewage question is next—a very patient but important "next."

CONDITION OF SUMMER RESORTS.—We are very glad, indeed, to find that the general public are commencing to attach some importance to the sanitary condition of the summer resorts

which they so largely patronize during the hot summer months. A great improvement in such conditions has occurred in recent years, and in some of the resorts the arrangements are in all respects satisfactory. Dr. Bryce, the Secretary of the Provincial Board of Health, has paid a great deal of attention to the matter during the last few years. We notice by the daily press that he left Toronto about the middle of May on a tour of inspection through the Muskoka District and other parts of Northern Ontario. He is armed with authority to enforce certain rules enacted by the Board; but we understand that it is not the desire of the provincial authorities to deal too severely with those who do not live up to the letter of such rules. A great effort, however, will be made to have everything made right, where things exist which are offensive or dangerous to health.

MEDICAL ITEMS.

A congress for the study of tuberculosis was held in Berlin from May 24 to 27, 1899.

Sir William Turner, President of the General Medical Council of Great Britain, received the honorary degree of LL.D. from the University of Cambridge, April 27th.

The Medical and Chirurgical Faculty of Maryland held its centennial meeting in McCoy Hall, at Johns Hopkins University, April 25-28, 1899, under the presidency of Dr. S. C. Chew, of Baltimore.

The Mississippi Valley Medical Association has changed the date of its annual meeting from September 12-15 to October 3-6, 1899, inclusive.

The American Climatological Association held its sixteenth annual meeting at the Academy of Medicine, New York City, May 9, 10 and 11, 1899, under the presidency of Dr. Beverly Robinson, of New York.

His Royal Highness the Prince of Wales has appointed the following as delegates on behalf of the National Association for the Prevention of Consumption to the Berlin Congress for the Prevention of Tuberculosis: Sir Hermann Weber, Mr. Malcolm Morris, Dr. Hillier, and Mr. C. Rube.

The autumn fete, to be known as the American festival, will be held in Chicago, beginning September 25th and ending October 9th, with the laying of the corner-stone of the Federal building, when the President and the Cabinet will be in the city. During this time the railroad fare to Chicago from all points will be a flat one fare rate for the round trip, without the necessity of certificates or signatures. The limit of the tickets is so long that a protracted stay can be made in Chicago in order to take advantage of the clinical facilities of the meeting, as well as enjoy the added attractions of the festival.

The American Association of Obstetricians and Gynecologists will hold its twelfth annual meeting at Indianapolis, Tuesday, Wednesday and Thursday, September 19, 20 and 21, 1899, under the presidency of Dr. Edward J. Ill, of Newark, N.J. Dr. Ill has appointed the following-named delegates to represent the Association at the third International Congress of Gynecology and Obstetrics, to be held at Amsterdam, August 8-12, 1899: Dr. J. H. Carstens, of Detroit; Dr. Clinton Cushing, of Washington; Dr. W. E. B. Davis, of Birmingham; Dr. B. Sherwood-Dunn, of Boston; Dr. L. H. Dunning, of Indianapolis; Dr. George Ben Johnston, of Richmond; Dr. L. S. McMurry, of Louisville; Dr. J. B. Murphy, of Chicago; Dr. Charles A. L. Reed, of Cincinnati; Dr. A. Vander Veer, of Albany, and Dr. X. O. Werder, of Pittsburg.

INTERNATIONAL CONGRESS FOR GYNECOLOGY AND OBSTETRICS.—The third International Congress for Gynecology and Obstetrics will take place at Amsterdam from the 8th to the 12th of August, 1899, under the patronage of the Minister of the Interior. The leading questions for discussion will be the following: 1. The surgical treatment of fibro-myoma. 2. The relative value of antiseptics and improved technic for the actual results in gynecological surgery. 3. The influence of posture on the form and dimensions of the pelvis. 4. The indication for Caesarian section compared to that for symphysectomy, craniotomy and premature induction of labor. MM. Doyen, Howard Kelly and Schauta will treat the first question; MM. Bunn, Richelot and Lawson Tait the second; MM. Bonnaire, Pinzani and Walcher the third, and MM. Leopold, Pinard, Pestalozza and Fancourt Barnes the fourth. The official languages are: English, French, German and Italian.

UNIVERSITY OF TORONTO—NEW DOCTORS OF LAW.—At a meeting of the Senate of the University, May 18th, it was decided to confer the honorary degree of LL.D. on the following

gentlemen: His Excellency the Governor-General of Canada; Dr. J. Beattie Crozier, of London, England, M.B. University of Toronto, 1872, on account of his "reputation as a writer and thinker." He is best known by his two works, "Civilization and Progress," and "History of Intellectual Development." Dr. Geo. M. Dawson, a son of Sir William Dawson, and one of the best known Canadian scientists; Mr. J. C. Glashan, of Ottawa, an educationalist and mathematician of the highest rank; Dr. G. M. Grant, Principal of Queen's University; Sir John Murray, of Edinburgh, a distinguished scientist. Dr. Wm. Osler, Professor of Medicine, Johns Hopkins University, Baltimore, formerly Professor of Physiology and Pathology in the University of McGill College for several years; also for a time Professor of Clinical Medicine in the University of Pennsylvania; author of the well-known text-book, "The Principles of Medicine," and of numerous other smaller books and monographs. He received his preliminary training in Weston under the late Rev. William Arthur Johnson; a portion of his early medical training under the late Dr. Bovell and the Toronto School of Medicine. He passed the first year examination in the University of Toronto in 1869, but completed his medical course at McGill.

Personals.

Hon. Dr. Montague returned from the Pacific coast May 2nd.

Dr. F. T. Bibby has removed from Kimberley to Clarksburg.

Dr. Frank J. Farley, of Trenton, went to New York early in May.

Dr. A. E. Gardner, of Vars, Ont., was married to Miss Salter, of Belleville, May 17th.

Dr. F. A. Rosebrugh, of Hamilton, was married to Miss Palmer, May 25th.

Dr. W. B. McKechnie, of Revelstoke, B.C., was married to Miss Cowen, May 15th.

Dr. R. D. Rudolf, of Toronto, sailed for England on the *Lake Superior*, May 16th.

Dr. J. Algernon Temple, of Toronto, spent a week in New York about the middle of May.

Dr. R. W. Large, formerly of Toronto, was married to Miss Geddes, Vancouver, May 22nd.

Dr. D. W. Montgomery, of California, is now visiting with his friends on Isabella Street, Toronto.

Dr. J. M. Platt, of Picton, ex-M.P. for Prince Edward County, has been appointed warden to the penitentiary in Kingston.

It was announced May 16th that Dr. George S. Rennie, of Hamilton, would be married to Miss Nathalie Hamilton, May 30th.

Dr. Jas. F. W. Ross left Toronto May 15th to spend a couple of weeks in his fishing shanty in the wilds of Muskoka beyond Algonquin Park.

Dr. Harry B. Anderson, of Toronto, has gone to England and Germany, and expects to return in good time for the winter session in Trinity Medical College.

Dr. James E. Graham, of Toronto, is considerably improved in health since the advent of warm weather. He went to Muskoka, May 24th, accompanied by Dr. W. P. Caven, who returned the following day.

Dr. Thaddeus A. Reamy, of Cincinnati, was tendered a complimentary dinner on Friday, April 28th, 1899, in celebration of his seventieth birthday. It was attended by 170 of his professional friends, with here and there a layman of conspicuous prominence.

Dr. Harry Way (M.B. Tor. '92), of Chicago, spent a few days in Toronto in the latter part of May. He gives glowing reports respecting the Chicago Canadian contingent.

Dr. H. W. Spence (Tor. '98) returned from England a few days ago. After spending a short time at his father's residence, Jarvis Street, Toronto, he went away to act as *locum tenens* for a month.

Dr. J. D. Thorburn, of Toronto, had a slight septicemia during the first week in May. Fortunately, the symptoms, which were somewhat serious for a couple of days, subsided rapidly, and his restoration to health was soon complete.

Dr. R. M. Bucke, Medical Superintendent of the London Asylum for Insane, has written a very interesting article, entitled "Portraits of Walt Whitman," which appears in the March number of the *New England Magazine*.

Dr. Thos. H. Middlebro (Tor. '92) was one of the resident physicians in the Toronto General Hospital, 1892-93. Since that time he has practised in Owen Sound, and has fairly earned a holiday, which he is now enjoying. He left Toronto May 12th with Dr. Anderson, and will do some post-graduate work in Great Britain and Germany.

Dr. Charles Jewett, of Brooklyn, professor of obstetrics and pediatrics at the Long Island College Hospital, was on April 29th, 1899, appointed by the trustees to be president of the faculty of that institution—a place made vacant by the resignation of Dr. Alexander J. C. Skene. Dr. Jewett has been a prominent teacher for nearly twenty years.

Dr. G. R. McDonagh paid a flying visit to New York in the latter part of May.

Dr. J. T. Duncan is now in London, giving special attention to the work in ophthalmology.

Dr. H. H. Oldright has removed to St. Catharines, having purchased from Dr. A. Leitch the house and good-will of his practice. Dr. Leitch has been in St. Catharines for twenty-five years, and has removed to St. Thomas. Dr. H. H. Oldright's residence, which is centrally located, is for sale.

Obituary.

JOHN R. FLOCK, M.D.

Dr. Flock died at his residence, London, Ont., May 16th, 1899. He received the degree of M.D. from the University of Victoria College in 1848. He acted as coroner for the city of London for many years.

CHARLES FAYETTE TAYLOR, M.D.

Dr. Taylor, of New York, well known as a very skillful orthopedic surgeon, died in April, aged 72. He was the inventor of many mechanical appliances which are now used in orthopedic surgery, and wrote many interesting articles and books, of which the best known in Canada is "The Mechanical Treatment of Hip-joint Disease."

SIR WILLIAM ROBERTS, B.A., M.D. LOND., F.R.C.P., F.R.S.

Sir William Roberts died April 16th, aged 69. He first made his reputation, which was world-wide, at Manchester, where he was well known for many years both as a teacher and a practitioner. His best known work was "A Practical Treatise on Urinary and Renal Diseases." In 1889 he removed to London, chiefly to obtain some leisure from an exacting practice. He had a severe attack of influenza, and in 1898 serious symptoms, due to a severe internal affection, appeared, and steadily grew worse until death came.

Mrs. Aikins, of Toronto, wife of Hon. J. C. Aikins, and mother of Dr. W. H. B. Aikins, died May 25th, 1899.

Progress of Medical Science.

MEDICINE.

IN CHARGE OF W. H. B. AIKINS, J. E. GRAHAM, J. FERGUSON, T. McMAHON,
H. J. HAMILTON, AND INGERSOLL OLMSTED.

Vaccination and Small-pox.

Dr. Redolfo Livi, in *Brit. Med. Jour.* for April 29th, 1899, gives the statistics of the Italian army, as regards vaccination and small-pox, since 1867. There have been 3,095,571 vaccinations. These statistics prove clearly that small-pox was much more fatal among those not vaccinated than among those who had been successfully vaccinated. On a basis of 10,000 there was an average of 280 cases of small-pox and 55 deaths where there had been no vaccination; but where vaccination had been recent and successful, in the army, there were about five cases and no deaths in the same number. The conclusion is clear that small-pox attacks a very much larger and causes a much higher death-rate among the non-vaccinated than among the vaccinated. When it does attack a properly vaccinated person the disease is much less severe. There is no ground for scientific opposition to vaccination.

Rheumatoid Arthritis and Gout.

Wm. Ewart, in *International Med. Jour.* for April, 1899, discusses the relationship between these diseases. He concludes there are wide differences in clinical history, pathology and treatment. When they do come into contact is where a person with gout becomes afflicted with rheumatoid arthritis, or *vice versa*. In pure rheumatoid arthritis low living with alkalies and colchicum would be poison to them. The treatment of the joints by dry heated air is very helpful. The internal use of abundance of water and attention to the bowels aid the elimination of toxins and waste products. Every effort should be made to raise the health and strength of the patient. Tonics are indicated, and arsenic seems to be of marked value. The diet should be easily digested, varied and nourishing. Stimulants are indicated, especially good red wine, in all cases where there is anemia.

Oyster Fever.

Dr. John W. Moore, in *The Practitioner* for March, 1899, has an article upon this subject. His observations are very

interesting. He considers that oyster poison produces three distinct forms of febrile disease. The oyster toxin may act by causing a very acute illness. Within a few hours the person is suddenly seized with acute gastro-intestinal disturbance, as nausea, vomiting and purging. After a few hours of misery the person recovers rapidly. The second form—a continued fever. This fever is ushered in by chills, and lasts from a week to two weeks. There is much depression, and the case may end fatally by coma, convulsions, peritonitis, or heart failure. In some instances the acute form may be followed by this more chronic type. Where elimination in the acute cases is not complete poisonous albuminose are formed. These give rise to severe nerve symptoms, as paresis, heart failure, coma, etc. Then, thirdly, there is true typhoid fever, as has been so clearly pointed out by Sir W. H. Broadbent.

The Liver in Diabetes Mellitus.

M. Le Dr. Piéry, of the Hospital Lyon (*Gazette des Hôpitaux*, February 4th, 1899), enters very fully into the rôle of the liver in all the forms of diabetes mellitus. In diabetes, with the condition of bronzed skin described by Hanot, in 1882, there are distinct diseased conditions in the liver. The organ is hypertrophied and has the appearance of old leather. The cells are more or less atrophied and infiltrated with a brownish black pigment. In pancreatic diabetes the more recent observations go to show that there are changes in the liver also, as hypertrophy and sclerosis. Enough attention has not yet been given to its minute anatomy in such cases of diabetes to enable one to form a definite opinion. When dogs are rendered diabetic by destruction of the pancreas, the liver becomes diseased. In nervous diabetes, as in the pancreatic, the liver is almost always hypertrophied. This hypertrophy is due to cirrhosis or fatty degeneration. In arthritic or constitutional diabetes the liver has been found either hypertrophied, atrophied, or in a state of fatty degeneration. These researches go to show that the liver plays an important part in diabetes.

The Gonococcus in Ulcerative Endocarditis.

Dr. Henry W. Berg (*Med. Record*, April 29th) mentions the interesting facts that in a patient suffering with gonorrhœa there were present the complications of pyelonephritis and ulcerative endocarditis. The temperature rose to 105° F. on the day of the patient's death. There were found vegetations and ulcers on two of the aortic valves. There was slight articular rheumatism. In the vegetations and ulcers on the aortic valves and in the pelvis of the left kidney were found diplococci that were regarded as gonococci. The finding of gono-

cocci, in pure culture, in the vegetations of ulcerative endocarditis, complicating gonorrhoea, would seem to prove that the gonococcus had been carried to the site of the lesion, and had caused the ulceration. This would seem to prove that a mixed infection is not necessary in all cases.

New Method of Treating Phthisis.

Dr. William Murrell, in *Med. Brief* for May, 1899, has an exceedingly interesting article on the above subject. His method, as the result of much experimentation with different preparations, is the inhalation of formic aldehyde. This is a definite chemical compound having the formula CH_2O . It is a gas obtained by the oxidation of methyl alcohol. It will form a 40 per cent. solution readily with water. For inhalation, usually a 6 per cent. solution is strong enough. Compressed air is made to bubble through the solution. The above solution may be made stronger or weaker to suit the patient. It sometimes causes some laryngeal irritation. The formaldehyde should be inhaled once or twice a day. In some cases it is good to drop 20 to 25 minims of the solution on a piece of lint and fasten it in front of the chest. This is renewed every three or four hours. Very good results have been obtained so far.

SURGERY.

IN CHARGE OF EDMUND E. KING, HERBERT A. BRUCE AND L. M. SWEETNAM.

A Case of Perforation of Gastric Ulcer; Operation; Second Operation and Recovery.

Dr. Sidney Phillips and Mr. A. Quarry Silcock report the following case which presents several features of interest. In the first place, thirty-three hours elapsed from the time at which the perforation occurred to the time of operation and yet the patient recovered. The successful result cannot be attributed to the absence of the gastric contents, for only an hour previously to the perforation she had partaken of a meal and peptonised milk was given even later. The fortunate issue must be ascribable, in part, to the smallness of the aperture of perforation and the rapid formation of peritoneal adhesions. The rarity of a successful result in perforation of the stomach when more than twenty-four hours have elapsed between the perforation and the operation is well known. This case also illustrates the great value of a gauze drain, for its presence rendered harmless the failure of the first attempt at closure of the perforation. The occurrence of parotitis in abdominal cases is always of interest.

and Mr. Silcock's suggestion as to the cause of this complication is very ingenious and may serve to explain many at least of the cases, if not all. We consider his recommendations as to the prophylactic treatment to be well worthy of trial.

A girl, aged 20 years, had in September, 1896, an attack of pain in the upper part of the abdomen with vomiting, and kept her bed a week; since then she had been subject about every three months to attacks of the same character, but of less severity and without vomiting. Between the attacks she had been free from pain and had not restricted her diet in any way. She had an attack in February, 1898, and one in May of the same year. There had never been any hematemesis. The attacks were regarded as hysterical. She was unusually well during August and until September 14th, 1898; on the 13th she ate a raw apple as she had frequently done before and had no discomfort after it. On the 14th she ate breakfast as usual, and at 11 a.m. she took some cocoa and bread and butter; one hour later she experienced severe pain in the upper part of the abdomen and lay down on the floor. Soon afterwards she vomited. Dr. A. B. Rendel, who saw her in the afternoon, found her somewhat collapsed, and he had a bed made up for her in the room where she was taken ill. She had peptonised milk and ice to take. The evening temperature was 100° F.; during the night there was pain in the abdomen and shoulders and she vomited twice. She was sent to St. Mary's Hospital on the 15th, at 5 p.m. She was a well-nourished, healthy-looking girl. The face was flushed, there were slight dark areolæ under the eyes, the features were a little pinched, the tongue was clean, abdominal movements were a little restrained, and there was hyperæsthesia over the whole abdominal surface. She complained of pain in the right iliac fossa, but there were no dullness on percussion, no tumor, and no tenderness in this region; there was, however, acute tenderness over an area of about two square inches immediately to the left of the linea alba just above the level of the umbilicus; here there was more resistance than elsewhere and slight defect in percussion resonance. Local dullness could be mapped out in the margin of the thorax. No stomach note could be obtained except in the region of the left axillary line; there was no bell sound obtainable. The pulse was 120, very sudden and jerky, and the temperature was 100.2°. She had vomited just before admission.

The local tenderness and the tension of the left rectus muscle suggested that the lesion was in the situation of the stomach and the symptoms pointed so strongly to a perforation that the pre-existence of an ulcer of the stomach seemed certain, though the history of paroxysmal attacks of pain with intermissions of

many weeks was unlike the course of ulcer as generally described. The fever, the quick pulse, and the flush of the patient's face made the presence of peritonitis certain and the general condition would, I felt sure, rapidly become worse. A little delay was occasioned in obtaining the consent of the mother of the girl to an operation.

Operation.—At 9 p.m., ether being administered, an incision two and a half inches long was made by Mr. Silcock a little below the xiphoid cartilage in the linea alba. Recent adhesions of lymph were found in all directions on opening the peritoneum. The wound was now lengthened and a horizontal cut was made to the left side for one and a half inches. A good deal of serum escaped, and upon examination a small perforation was found a little to the left of the linea alba in the lower part of the anterior wall of the stomach, through which escaped a small quantity of frothy mucus. The surrounding peritoneum was covered with soft adhesive lymph. After cleansing the wound several unsuccessful attempts were made to close the perforation by invaginating its edges and stitching with Lembert's sutures. However, by the aid of long rectangular cleft palate needles and silk sutures this was ultimately effected. The wound was washed out with sterilized water, the greater part of the vertical parietal incision was closed with silk-worm gut sutures, and a large double cyanide gauze drain and dressing were applied. The operation lasted one and a half hours. On the 17th the temperature was from 100° to 102° . There was a copious greenish discharge; the sutures had evidently given way, and by the aid of an electric lamp the perforation could be seen at the bottom of the wound. On the 19th there was acute pain with tenderness and swelling of the left parotid gland, the temperature rising to 102° . Belladonna fomentations were applied, and the acid drops were ordered to be sucked to stimulate the flow of saliva; the nutrient enemata were well retained. On the 21st the maximum temperature was 101° . The discharge was offensive. Iodoform gauze plugging was substituted for cyanide. On the 22nd the temperature was 100.4° . There was dullness with some tenderness in the left hypochondrium, and Mr. Silcock passed a long probe from the wound towards the left into a cavity from which the offensive discharge could be seen to flow, and decided to at once make a counter opening. Under an anesthetic the wound was well irrigated. A counter opening by a horizontal incision one and a half inches long was made in the eighth left costal space; a large drainage tube was then passed from one wound to the other and the cavity was again irrigated. The little finger inserted through the perforation detected no signs of ulceration of the surrounding mucous membrane. With

some difficulty the edges of the perforation were invaginated and approximated by three Lembert's sutures. The sutures were deeply passed and must have included nearly the whole thickness of the gastric wall. The wound was plugged lightly with cyanide gauze and a dressing was applied. The patient recovered from the anesthetic without sickness. The temperature rose to 104° in the afternoon and fell to 102° by night. The wound was dressed at night; it was less offensive and there was no discharge from the stomach. On the 23rd the maximum temperature was 100.6° . The discharge was still offensive, but none came from the stomach. All parts of the wound were covered with healthy granulations. On the 24th she took food by the mouth for the first time, three drachms of sweetened barley water being allowed every two hours. There was no leakage from the stomach. From this time forward the patient made an uninterrupted recovery. On November 21st she got up, the wounds being practically closed, and was discharged to a convalescent home on December 14th.

The failure to effect permanent closure of the perforation at the first operation and the success attending the second, show how unnecessary it is, as often has been insisted, to do more than provide for the exit of the extravasated stomach contents from the peritoneal cavity, where that is possible, in cases in which the complete operation would, from its complexity or long duration, endanger life. The occurrence of parotitis in abdominal cases is not infrequent. May it not be due to the fact that such patients often enough suffer from stomatitis, for but little food is taken and that fluid in kind, or possibly none may be allowed, as in our case, the mucous membrane thus becomes fouled, there is no stimulus to the flow of saliva; consequently, infective organisms may find their way up the parotid or other salivary duct, the current of fluid in which may be materially lessened in force and volume. Hence it is well to see that the mouth and teeth are cleansed, and possibly it may be a good thing to allow the patient to stimulate the flow of saliva by some such means as that adopted in our case. The patient reported herself in January, 1899, as perfectly well.—*Lancet*, 25th March.

ORTHOPEDIC SURGERY.

IN CHARGE OF CLARENCE L. STARR, M.D.

Metatarsalgia.

Jones and Tubby (*Annals of Surgery*, September, 1898) have published a very interesting paper on metatarsalgia, or Morton's disease, in which they disagree with the commonly accepted theory as to the etiology of the disease. Most surgeons accept the theory of Morton, that the pain is due to compression of the superficial branch of the external plantar nerve between the heads of the fourth and fifth metatarsal bones. The authors, however, hold that the clinical symptoms as well as the anatomical facts do not support this, but do accord much better with the theory of a breaking down of the transverse arch of the foot and a treading upon the nerve.

The treatment in all severe grades outlined as the simplest and best is a resection of the head of the fourth metatarsal bone.

Dr. Whitman, in an article in *Medical Record* of August 6th, 1898, shows that there may be a flattening of the transverse arch and a considerable degree of laxity of the ligaments joining the metatarsal bones, and as a consequence still get pressure from the overriding, lax, fifth metatarsal bone.

Dr. V. P. Gibney (*Medical Record*, February 4th, 1899) read a paper before the Practitioners' Society, in which he briefly outlines the etiology and pathology of metatarsalgia and the treatment from an orthopedic standpoint.

Metatarsalgia, commonly known as "Morton's toe," after Dr. Thos. G. Morton, of Philadelphia, is a neuralgia affecting the metatarsal region. The neuralgia is due to pressure of the branches of the external plantar nerve, seldom of the internal. Whether the pressure is due to pinching of the nerve between the heads of the fourth and fifth metatarsal bones, or to pressure from ligamentous thickening and flattening of the transverse arch, is difficult to ascertain. The anatomical relationship is such that the head of the fifth metatarsal is from three-eighths to one-half inch posterior to that of the fourth, and the digital branch of external plantar nerve lies between. The fourth and fifth metatarsals are much more loose in their attachments than the others, and can be readily rolled one upon another. The first, second and third are more fixed and do not permit of so much movement, and it is an interesting clinical fact that the internal plantar nerve is seldom implicated.

The author cites fifteen cases of Jones' curec after removal of the head of fourth metatarsal, and equally brilliant results by Morton. Also that two cases came under his observation

where pain persisted after operation, which was entirely relieved by specially constructed shoe.

Dr. Gibney further says he has yet to encounter a case which did not yield to treatment by properly constructed shoes, and he is unwilling to recommend operation when shoes will give permanent relief. In analyzing fifty-seven cases he finds eighteen cured, *i.e.*, the prescribed shoe is no longer necessary; and thirty-nine relieved, *i.e.*, are still wearing shoe or some modification of it. In a shoe for metatarsalgia the upper must fit accurately over the instep and compress the proximal ends of metatarsals; no pressure against distal ends and yet the width not so great as to allow too much expansion. Insole should be slightly convex across metatarso-phalangeal region to preserve the transverse arch. If the longitudinal arch is weak, strong shanks of partially tempered steel should extend well forward, almost to distal ends of metatarsals.

Calot's Treatment of Spinal Caries.

Lange, of Munich (*Wiener Klinik*), very clearly sets forth the present position of most surgeons with regard to the forcible correction of the curvature in Pott's disease. He holds that while in the hands of skilful men, the operation is not attended with much risk to life, yet the treatment is open to serious objection. The early results may be exceedingly promising, but as time goes on, the improvement in the majority of cases does not prove permanent.

The gap which is made by the opening up of the carious vertebrae, is not yet proven to fill up with bone or anything firmer than fibrous tissue, at the best. In most cases the gap is probably filled with blood, detritus and pus, or later with tuberculous granulations. These are never firm and must leave the spine very unstable.

In some cases it is possible that osseous fusion of the arches or processes of the diseased vertebrae may take place, and then the straightened spine may acquire a certain degree of strength or stability. Such a spine, however, must always be in danger of fracture from slight injury, and fracture is likely to be attended with serious or even fatal results from compression of the cord.

According to Lange, the only class of cases in which Calot's treatment is indicated, is that in which there is associated with the angular curvature a persistent paralysis of the lower extremities. As there can be no doubt of the efficacy of the treatment in this class of cases, it is thought by the author that the surgeon is warranted in assuming the risks, immediate and remote, of forcible correction in order quickly to relieve the patient from the distressing symptoms attendant on paraplegia.

Forcible Reduction in Pott's Disease.

The *Medical Record* thus summarizes the views of Dr. Albert H. Freiburg (*Cincinnati Lancet-Clinic*) on the forcible reduction in Pott's disease:

1. Forcible reduction involves danger to life; this is, however, not sufficiently great to warrant its banishment, especially in properly selected cases.

2. The reduction of firmly ankylosed kyphoses is to be condemned.

3. The application of this method is justifiable in cases of paraplegia when immobilization has failed.

4. It is exceedingly probable that many kyphoses treated by this method will recur.

5. Forcible reduction may prove of great value in severe rachitic scolioses and kyphoses, and under these conditions will probably be found to be almost without danger.

Cyclo-Therapeutics.

Dr. Siegfried, of Bad Nauheim (*Brit. Med. Jour.*), has strongly recommended cycling as a means of obtaining active and passive motion in the lower limbs which are at the same time relieved from supporting the body weight.

He employs the exercise in ankylosis from joint disease, in muscular atrophies, peripheral paralysis, cardiac insufficiency and the like.

The author draws his conclusions from study of ninety-seven cases in which there were over 400 pulse tracings made. He gives notes of a case of rheumatism with flexion of left hip and knee, and more or less complete ankylosis, cured so as to be able to ride thirty-five miles in a day, five months after commencing treatment, when he had to be assisted to a seat on the machine.

Three other cases are noted, one of gout with almost complete cure of symptoms, physical and mental, and one of cardiac insufficiency in which the tracings showed marked improvement in rhythm.

The author insists that patients must be taught that cycling for them is a matter of treatment and not of amusement, and that the physician must keep the exercises under his own observation.

The writer's experience is with a single case of rheumatic arthritis, and although some benefit was obtained by daily exercise on the wheel, yet the improvement did not seem permanent, and the stiffness returned as the wheel was laid aside for the winter.

OPHTHALMOLOGY AND OTOTOLOGY.

IN CHARGE OF G. STERLING RYERSON.

Simple Enucleation not a proper Surgical Procedure.

H. W. Morton, Minneapolis (*Annals of Ophthalmology*, January, 1899): The indications for enucleation of eye-ball are: 1. Traumatism or sequelæ of traumatism: 2. Inflammatory processes and their sequelæ: 3. Tumors whether intra or extra ocular. He thus describes the operation of *implantation*, not Mule's operation, in which the capsule of Jenon is used as a retaining cup for the glass sphere instead of the sclera. He claims advantages over excision operation. Implantation was also devised by Frost, of London, each originating without knowledge of the other's work. The advantages are:

ENUCLEATION.

1. Complete removal of globe and contents.
2. No stump.
3. Disturbances of all muscular relations and arrest of movement.
4. A fixed staring cup attracting attention.
5. Patient shuns society.
6. Arrested development of orbit in children.
7. Epiphora.
8. Accumulation of mucus, etc., in the artificial eye.

IMPLANTATION OR MULE'S OPERATION.

1. Retention of the framework of the eye.
2. A firm round globe forming a perfect support for an artificial eye.
3. Perfect harmony of muscular movement retained.
4. When fitted with selected eye defies detection.
5. No qualms about personal appearance.
6. No interference with growth of orbit.
7. Owing to better position of eye, tears drain away perfectly.
8. Not the case where a sphere is worn.

Protargol.

Wicherkiewicz, Krakau (*Die Oph. klinik*, September, 1898). W. says his experiences with protargol have been decidedly satisfactory. It has silver for a base and contains 3.3 per cent. more than the new silver salts. Argentanin contains 6.35 per cent., argonin 4.2 per cent. Protargol is not as good as nitrate of silver in acute granular or catarrhal conjunctivitis. Is particularly useful in ulcers of the cornea in 5 per cent. solution. In suppuration of the lachrymal passages it is the best medi-

cine we have. The tear sac and canal should be dilated fully and washed out, then a 10 to 20 per cent. solution of protargol injected. Protargol is, according to W., an absolute specific in blennorrhœa of new-born infants or adults. He uses a 20 per cent. solution. He also uses a 1-10,000 sublimate ointment. He has compared work of protargol and nitrate of silver, in many cases using one in one eye and the other in the other, with the above results.

Modern Views on Trachoma.

Schulhof (*Wien. med. Presse*, Nos. 24, 25, 1898) gives a complete summary of recent work in etiology, pathology and treatment of trachoma. He quotes statistics. In thirty Austrian counties there were in 1896 nearly 30,000 sufferers, while in the Russian army in 1896 the number of sufferers reached the enormous proportion of 62 per cent. The author draws the following conclusions as the result of his investigations: Its appearance is favored to a great extent by special conditions, such as race, locality, general nutrition and occupation. The actual natural history is not yet established; experiments and inoculations on animals have failed so far. The hypertrophy of the conjunctiva is the principal characteristic of the morbid process. Hitherto the following has been accepted as the best treatment: Solution of nitrate of silver or its substitutes, argonin or protargol, sulphate of copper, washing with sublimate, galvano-cautery, and in very obstinate cases, jequirity, peritomy, and removal of hypertrophic folds. Among the newer remedies are guaiacol, glycerine, ichthyol, sozo-iodol and electrolysis. (He does not mention the most important, Darier's treatment and cataphoresis.—G. S. R.)

A Suggestion for Anesthetists.

Everybody who has had experience in the administration of chloroform or ether to young subjects has had trouble in getting them started without a scene, which in private practice is very trying to all concerned. I have been in the habit for the past two years of having a little eau de cologne or other perfume dropped on the inhaler to begin with; then after a few minutes chloroform is added. This procedure has the effect of lessening the child's initial terrors, and saves wear and tear both to the operator and to the anxious parents.

G. S. R.

LARYNGOLOGY AND RHINOLOGY.

IN CHARGE OF J. PRICE-BROWN.

Fibrinous Rhinitis.

Gerber (*Monat. f. Ohrenheilkunde*, July, 1898). In seven of the cases examined virulent diphtheria bacilli were found. In other cases, the number not being given, streptococci, staphylococci, diplococci, etc., were found without the Klebs-Löffler bacillus. Gerber considers that the clinical pictures may be identical while the diseases are different. Of the two, true diphtheria is the more severe affection, and, he says, may undoubtedly be present without membrane. Non-diphtheritic fibrinous rhinitis usually affects children. It runs a favorable course of two or three weeks, rarely affecting other mucous membranes. Gerber considers the difference between this and true diphtheria to be one of degree only, dependent upon the vulnerability of the mucous membrane.

Tubular Epithelioma of the Nose.

Bronner (*Jour. of Laryn., Rhin. and Otol.*, March, 1899) showed a microscopic specimen of tubular epithelioma of the nose. The growth which was the size of a large pea had been removed from the nasal mucous membrane above the front end of the lower turbinated. The operation was performed ten years ago when the man from whom it was taken was forty-seven years old. There was a history of partial nasal obstruction and frequent hemorrhage from the nostril. The growth was removed by scissors, after which the bone was burnt with the galvano-cautery. There has been no recurrence. The Clinical Research Association reported it as a case of malignant growth of epithelial type, which might be classed as a tubular epithelioma. At the periphery beneath the mucous membrane, tubules with a definite lumen could be seen.

Two Naso-Pharyngeal Polypi of Enormous Size.

Weil (*Weiner med. Woch.*, January, 1899) reports one case. It was attached all along the posterior edge of the vomer. Two hemispherical processes filled the naso-pharynx and caused complete nasal obstruction. One large branch of the polypus filled the right nasal cavity as far as the anterior naris, while a pear-shaped portion, whose lower extremity could only be seen by strongly depressing the tongue, covered the whole post-pharyngeal wall. Weil removed it through the post-pharynx in one piece. Its weight was 45 grammes.

Max Thorne (*Laryngoscope*, April, 1899) reports the other case, which was even larger. Hearing was much diminished,

there was complete nasal stenosis, and the voice had the characteristic nasal twang. The left nasal fossa was free, but the right one, posteriorly, was filled with the mass. The attachment was at the posterior portion of the right nasal fossa. It was removed *en masse* by means of a cold wire snare passed up behind the palate and round the growth. It was composed of many large and small nodules, some of them of the size of a small hen's egg. The pedicle was slender, not larger than a lead-pencil. The weight was fifty grammes. The patient was a man aged thirty years.

The abstractor might likewise refer to one which he removed from the naso-pharynx of a woman aged 31, on April 24th, 1899. The physician who brought this case for treatment had already removed a polypus from the left nostril. The probability, however, is that this was only a projection forward of the original growth into the naris from the naso-pharynx. On the left side there was complete stenosis. Post-nasal examination revealed a large lobulated, firm and pinkish tumor, filling the post-nasal pharynx. A cold snare was passed up behind the soft palate, and was adjusted over the growth by the index finger of the left hand. The whole was removed in one mass. Although much smaller than the two already recorded, its weight was half an ounce, or sixteen grammes.

The abstractor would also like to make one remark, which so far he has not observed in reading up the literature upon this subject, and that is—whenever a true fibroma edematosa, or naso-pharyngeal polypus, is successfully removed, it is almost invariably taken away in a single piece. It is difficult enough, and requires care and patience to adjust the snare well up around the body of the tumor; but it is next to impossible to press the wire closely up on all sides of the mass, so as to grasp only the pedicle. Still, when the snare is tightened, it does not sever a piece, but removes the whole. The reason is obvious on examining the structure of the polypus. The body has often been years in growing, and is dense, and fibrous and massive in character, while the pedicle is formed largely of blood vessels and mucous membrane, and contains comparatively little fibrous tissue; and hence yields more readily to the traction placed upon it than does the body of the tumor.

A Case of Thyroid Gland at Base of the Tongue.

Reintjes (*Monat. fur Ohrenheilkunde*, September, 1898) relates the history. Patient, male, aged twenty-five years, had always spoken as if he had a lump in his throat. He spat blood repeatedly. On examination a dark-brown, smooth, elastic swelling was discovered at the base of the tongue, between the circumvallate papillæ and the epiglottis. Electrolysis was

tried, but proved unsuccessful in its removal. Dr. Kolff operated. A Trendelenburg cannula was introduced into the trachea, the tongue was pulled forward, and the anterior pillars of the fauces temporarily divided. The strong capsule of the tumor was then split horizontally, and the mass shelled out without much bleeding. The sac and the anterior pillars of the fauces were then stitched up. Recovery was excellent; but the normal thyroid could not be felt in its usual position. Since the operation symptoms of myxedema have appeared.

Paralysis of the Tongue—Stenosis of the Esophagus.

Sendziak (*Jour. of Laryn. Rhin. and Otol.*, March, 1899) gives "a contribution to the diagnostic signification of Rontgen's Rays." in connection with a male patient under his care, aged 55. For six months there had been difficulty in swallowing in the upper part of the esophagus. As the case was considered malignant bougies had been used with some benefit. On examination of the larynx the right vocal cord was found to be paralyzed, and in the phonatory position. As this was an exceedingly rare occurrence, the left cord being the one usually primarily involved, examination by Rontgen rays was resorted to. It was found by transillumination, in front as well as behind, that the thoracic glands, the *ganglions peri tracheo bronchiques* of Baréty, could be distinctly seen as dark spots on the right side, while on the left they did not present any changes.

The writer says: "If in the above case the diagnostic signification of Rontgen's method, in view of the existence of cancerous process of the esophagus, in which the paralyzes of the larynx are not among the great rarities, was not demonstrated, but rather confirmatory, so in the paralyzes of the larynx resulting from compression by pathologically changed glands alone, which cannot be discovered by means of physical methods, Rontgen rays may have the greatest importance."

Wehnelt's New Interrupter—Improvement in X-Ray Apparatus.

MacIntyre (*Jour. Laryn., Rhin. and Otol.*, April, 1899) gives an account of the great improvement in technique which this new instrument has so recently produced. A further report of it will be found in the *Elektrotechnische Zeitschrift*, January 22nd, 1899. The advantages of this interrupter are simplicity of construction, great increase in the efficiency of the coil, and cheapness. The reduction in time of exposure, when photographing, is marvellous. The interruptions sometimes amount to 1,500 per second, and give great steadiness upon the fluorescent screen.

It naturally follows that the examination of the nose, accessory cavities, larynx and chest for foreign bodies will be greatly facilitated; while diagnosis of lesions in the soft tissues will be improved. Coils of any size will now be capable of exciting Crookes' tubes hitherto beyond their range. The interrupter is practically an ordinary cell, consisting of dissimilar metals in an acid solution. As a rule the one is made of lead and the other of platinum, the former being large and the latter very small.

Wehnelt describes the principle involved as follows: "If a current be sent by means of the electrodes of unequal surface through an electrolyte, the electro-motive force applied being considerably greater than the counter-electro-motive force of polarization, well-known light and heat phenomena may be observed on the electrode with the smaller surface. The latter is called 'active electrode.'"

Suprarenal Gland of the Sheep.

M. D. Lederman (*Laryngoscope*, April, 1899) believes that the extract of the suprarenal gland of the sheep has established a permanent position for itself in the therapeutic armamentarium of the rhinologist. By its use bloodless operations upon the nasal septum can be accomplished, and the "fear of blood" sentiment often met with in neurotic patients can be removed by the conscientious statement that little, if any, blood will be lost during the operation.

The difficulties heretofore met with in the preparation of the desiccated gland, can now, in a great measure, be removed. It is well known that the watery solutions rapidly become putrid and unfit for use. The addition of antiseptics, while they retard putrefaction, unfortunately interferes with the hemostatic properties of the gland.

After many experiments Lederman has found a 25 per cent. solution of glycerine in water to be a very satisfactory menstruum for solution of the gland; and glycerine itself, being somewhat antiseptic, prevents putrefaction without retarding the physiological action of the gland.

His method of application has been to apply the glycerowatery extract by means of cotton applications before and immediately after the application of cocaine. Constitutional symptoms of cocainism are thus avoided. Two or three applications of the suprarenal extract are sufficient. After its use the swollen mucous membrane rapidly assumes a contracted appearance, and an ischemic condition exists.

In next performing the operation very little blood will escape. Reaction, however, sometimes occurs and it is always judicious to insert a nasal tampon for twenty-four hours after-

wards. The best kind of tampon Lederman claims to be one of nosophen gauze, as it is antiseptic and keeps the wound dry.

His plan of preparing the desiccated gland is to place forty grains of the gland (Armour) in half an ounce of the glycero-aqueous solution. It is put in a wide-mouthed bottle and well shaken and allowed to stand in a room at ordinary temperature for forty-eight hours or so. During this time it is occasionally shaken. The mixture is then filtered through filter paper into a clean bottle. The result is amber-colored, and is ready for use. It is advisable to keep all but that required for immediate use in a cool place.

Diphtheria.

W. W. Lambert, Kamloops, B.C., "Sixteen Cases of Serum-treated Diphtheria" (*Montreal Med. Jour.*, March, 1899).

In all these cases the writer appears to have depended entirely upon serum-therapy for treatment, for there is no mention in his article of any other treatment whatever. Fortunately all the cases recovered but one. In this case the patient, aged fourteen months, did not come under treatment until the sixth day; and, notwithstanding that he administered, by injection, 12,500 units of antitoxine in three doses, the child died (!). The other fifteen cases were between the ages of seven years and fifty years. All were treated early, only two being as late as the third day. The largest amount of antitoxine given to any of them was 5,000 units to a boy twelve years of age. All were cured between the period of six hours and four days.

Five of the cases are reported as "diphtheria and scarlet fever" and eleven as "diphtheria."

Bacteriological examination is not mentioned (?), neither is the Klebs-Loeffler bacillus referred to in the article (?).

Speaking of serum Lambert says that it has no unpleasant or harmful effect upon the system, and should be used fearlessly. He claims that it is of great value in diagnosis, and is so certain in its action that should diphtheria be present the symptoms will ameliorate; and should no effect be produced the case will be scarlet fever or ordinary tonsillitis. He says that the injection should not be made in the arm as it will be followed by local dermatitis or urticaria.

PEDIATRICS.

IN CHARGE OF ALLEN BAINES, W. J. GREIG, AND W. B. THISTLE.

Dysarthria and Delay in Learning to Speak following Cerebral Disturbance in Infancy.

A paper on this subject was read before the Royal Medical and Chirurgical Society of London by Dr. F. Parker Weber. The child upon whose case Dr. Weber based his paper, was of healthy parentage and was now seven years old. Until two years of age he was quite well and learning to talk like other children. At this time he was attacked by some acute disease, with cerebral symptoms. The illness left him unable to speak, but unaffected in any other way. When seen at five years of age he was able to utter peculiar sounds, doubtless an attempt at articulate language. He was physically fairly well developed, could hear well, understand what was said to him, and appeared to be of average intelligence. He then gradually began to speak, though with obvious difficulty in getting the sounds out and with great defects in pronunciation, dropping the consonants at the end of most words, and replacing the sounds of *k*, *g* (hard or soft), *ch*, and *s* by a *d*-sound or *t*-sound. Such "lalling"-like defects, together with stammering, rendered his speech most imperfect. He could recognize single figures and the letters of the alphabet, but could hardly recognize even short words when shown them on paper. He sometimes made mistakes when writing his own Christian name, although he had doubtless been repeatedly drilled at it. He could not recognize his name when shown it in printed characters. He seemed, in fact, almost word-blind. Such was his condition at the age of seven, when seen in January, 1899. The present case and similar cases differed from the typical ones of cerebral diplegia, with bulbar (pseudo-bulbar) symptoms, in the fact that the movements of the palate and the mechanism of swallowing were not in the least affected. A practical point in regard to the present case and similar cases was that the speech centres, although damaged by some early disease, seemed, nevertheless, capable of ultimate fairly normal development. This was confirmed in the present instance by the rapid progress which the boy was making since real trouble had been taken in teaching him by the oral and other methods.

Biliary Calculi in Children.

Three cases of biliary calculi in children were reported at the meeting of the London Pathological Society by Dr. G. T. Still (*British Med. Jour.*, April 8th, 1899). The cases had all been encountered within six months at Great Ormond Street

Hospital. The author believes the condition to be of rare occurrence in childhood. In the first case, aged nine months, there were vomiting, clay-colored stools, no jaundice and no colic. After death, which occurred from other causes, there were found eleven small black, friable calculi of pigment, three of which were impacted in the common bile-duct. The second case was that of a girl, aged eight months, who died with tuberculous meningitis. There was no jaundice or abdominal pain. There were three minute calculi of pigment in the gall-bladder. In the third case, a boy, there were abdominal pain and vomiting, but no jaundice; the calculi were of the same kind. The author had seen what he considered a fourth case during life, where there were recurrences of vomiting, abdominal pain, and jaundice. Altogether he had been able to collect twenty published cases, of which ten were in infants. In some, calculi had been found in the feces, in others at the necropsy. In many, colic and jaundice had been observed during life; the usual cause of infantile colic, nevertheless, was renal. The biliary calculi might be formed during intrauterine life, and the speaker thought that the viscosity of the bile in infancy, which led to a secondary stagnation, was probably connected with the formation of such concretions.

Syringo-Myelia with Pharyngeal and Laryngeal Lesions.

The proceedings of the Harveian Society of London, in the *British Med. Jour.* for April 15th, contains the following report of an unusually interesting case of this remarkable affection. The case was presented by Dr. Herbert Tilley, and gave the following history: The patient was a girl of fifteen in whom there was paresis of the right half of the palate, pharynx and right vocal cord. Other points of interest were the blunting of painful impressions and complete loss of thermal impressions all over both superior extremities and certain well-defined areas of the neck and trunk, atrophy of the small muscles of the hands—the latter being in the *main en griffe* position—moderate wasting of the flexors and extensors of the wrist, and slight nystagmic jerks of both eyes. A painless but severe burn on the hand and a gruffness of the voice, with some difficulty in swallowing, first led the patient to seek advice. The pharyngeal and laryngeal conditions were much improved during the past two months, during which time the patient had been taking strychnine.

Peripheral Neuritis.

The following interesting case of peripheral neuritis is found in the report of the Harveian Society proceedings (*British Med. Jour.*, April 29th, 1899). Patient, a child of three, was first

thought to be suffering from anterior poliomyelitis, but later the diagnosis was changed to peripheral neuritis. All the muscles of the shoulder and upper arm were flaccid and wasted. The history given was that in September, 1898, the child had a sore throat which "broke," with a discharge by the mouth. The next day there was complete paralysis of both arms and both legs; the child could not sit up. Improvement took place quickly. In a week the child began to use the left arm; in a month she could walk. For fourteen days she had no sensation in the right arm, being unable to feel pins stuck into it. The child, as shown, could walk perfectly and use the left arm perfectly. The right arm was affected as stated; there was no loss of sensation in it. Both knee-jerks were absent. Another point in the history was, that the day after birth the right arm was noticed to be very much thinner than the left. Until the present illness, however, the child was able to use it perfectly well in feeding herself, etc. Although the condition of the throat was obviously not diphtheria, and although the paralysis followed the throat remarkably quickly, the conclusion reached was that the case was one of neuritis, following the affection of the throat, and damaging particularly a limb which had previously shown evidence of bad nutrition from some cause operating before birth. The loss of sensation and the continued absence of knee-jerks especially led to this diagnosis.

A Case of Cystic Disease of the Breast in a Boy Aged Three.

The patient was admitted to the Victoria Hospital for Children, Chelsea, under the care of Mr. D'Arcy Power, F.R.C.S. According to the account given by the mother enlargement began eighteen months ago. No pain at any time and no discharge from the nipple. On examination there was felt in the left breast a soft round tumor about the size of half a tangerine orange. It appeared to be cystic in character and adherent to the skin. The nipple was normal, and there was no "dimpling" over the tumor. No edge could be made out, and there were no enlarged glands in the axilla; no tenderness on palpation. The entire gland was excised together with the fascia over the pectoral muscle.

Mr. Powers considered the case unusually interesting because of the rarity of cystic disease in so young a boy.—*British Med. Journ.*, April 29th, 1899.

Correspondence.

OPHTHALMOLOGICAL WORK IN BIRMINGHAM— THE TREATMENT OF SQUINT.

Editors PRACTITIONER AND REVIEW :

To any medical man a visit to Birmingham would be interesting, for it is a great medical centre, and in the magnificent buildings and equipment of the General Hospital the city may take a justifiable pride. But any one interested in ophthalmology will be specially pleased to see the work being done by Owen, Priestley and Smith. As being of general interest I may refer to the work being done in connection with strabismus. Priestley Smith selected this as the subject of the Bowman lecture which he gave last year in London. He spoke then of what had been accomplished by Javal, of Paris, and gave his own experience, which has been large, especially among children.

Children are brought to him not only from the Midlands District, but from many parts of England. His usual practice is as follows: On the first visit the eyes are examined, the angle taken, and atropine drops ordered. The second visit (which may be the following day, but is usually the third or fourth), the vision and refraction are taken, and glasses ordered, if needed. Then the directions for educating the squinting eye are given, and the child sent home. If no operation is needed, he only needs to return at long intervals usually.

The earlier a squint can be put under treatment after its appearance the better the chance of complete cure. This fact the people are beginning to recognize, and, as a consequence, very young children are brought to this clinic for treatment. In regard to results these are, so far as children are concerned, excellent on the whole. In a considerable number of cases false fixation has been replaced by true—the eyes becoming straight. In adults the results are not so good, but even here some cases are seen showing in a remarkable manner what systematic and intelligent treatment will accomplish.

J. T. DUNCAN.

BIRMINGHAM, May 12th, 1899.

Book Reviews.

The Practice of Obstetrics. By American Authors. Edited by CHARLES JEWETT, M.D., Professor of Obstetrics and Diseases of Children in the Long Island College Hospital, New York. New York and Philadelphia: Lea Brothers & Co. 1899

The work is taken up in eight sections, the first of these dealing with Pelvic Anatomy. Not much is added to our knowledge of the pelvic fascia in it. The author gives some original and very interesting views on the insertion and function of the levator ani muscle, and it is regrettable that the two figures (12 and 13) which illustrate them do not elucidate them very well.

Part II., on the Physiology of Pregnancy, is very good. Chapter IV., on the Diagnosis of Pregnancy, especially so.

Part III. takes us over the Physiology of Pregnancy. The usual statement is made that the "head is born by extension." We think with Dr. Porter Mathew and others that this statement should be qualified. The head does not become extended till its greatest diameter has passed the vulvar outlet. In forceps cases especially it is important to remember this, as premature extension will often rupture the perineum.

We are glad to notice the stress laid on abdominal palpation and auscultation as a means of diagnosing presentation and position. This section is particularly good. In regard to obstetric antisepsis we think it more desirable to lay down definitely one good method than to quote three or four without special emphasis on any. The section on the Management of the First Stage of Labor is excellent, though we think that more might have been said on the relief of pain. In the "perineal stage" we should say emphatically, that one hand should *not* be placed "on the part of the pelvic floor which overlies the head." The plan of waiting half an hour for the placenta and then resorting to the "Credé" method, as advocated in this section by Charles Jewett, we do not think as good as the one recommended in the section on puerperal infection by Whitridge Williams, which is the Rotunda method. Compresses should *not* be used under the binder.

Part IV., on the Physiology of the Puerperium. The subject is well treated, and the matter well arranged.

In Part V., on the Pathology of Pregnancy we think that altogether too much space is devoted to the subject of Monsters. The eight full plates which are introduced here might have been omitted without lessening the utility of the work, and with great saving in the cost of production. Apart from this, Part V. is excellent.

In Part VI. the matter and arrangement of the first two chapters, on Anomalies of the Mechanism, is very good.

With regard to the treatment of eclampsia we find ourselves at issue with Dr. Clifton Edgar on some points. At the Burnside Lying-in-Hospital in Toronto, under care of Dr. A. H. Wright, morphine has been freely used for the control of eclamptic convulsions, without any of the ill effects which have occurred in Dr. Edgar's experience. In the same institution the removal of small quantities of blood has, in *certain* cases, and the administration of saline solutions per rectum in *all* cases proved to be of undoubted value. With glonoin and veratrum viride we have had no experience. We heartily endorse his rejection of pilocarpine in the presence of eclamptic convulsions.

In Part VII., the Pathology of the Puerperium, the important subject of Puerperal Infection comes up. As was to be expected, the bacteriology of this question has been most ably dealt with by Whitridge Williams. We cannot, however, agree with him in his description of the symptoms. "In cases of septic endometritis everything goes smoothly for the first three or four days of the puerperium, when our patient, who thus far has done perfectly well, suddenly experiences more or less malaise," etc. It was pointed out by Professor A. H. Wright, in a paper read before the Toronto Medical Society this winter that puerperal fever *never* sets in in a patient who has done perfectly well up to the third or fourth day. There are always prodromata, of which the principal are, rapid pulse, headache, sleeplessness and bad taste. Dr. Porter Mathew, in an examination of the clinical records of 12,000 cases of puerperal fever, did not find a single instance in which the puerperium had been perfectly normal up to the time of onset of the chill and fever. In treatment he advocates digital exploration of the uterus, which we endorse, but omits any reference to the benefits to be derived from saline catharsis, which has given such good results in the hands of Professor A. H. Wright and those who have followed his teaching.

With Part VIII., on Obstetric Surgery, we are, in the main, in accord. We cannot, however, agree with the author when he writes that "external version is indicated in cases where a breach presentation is diagnosed during pregnancy." Manual rotation, in occipito-posterior cases, has been more successful in his hands than in ours. Throughout the whole book we admire the arrangement of the matter, which makes it easy to grasp the salient points. We consider it one of the best that has appeared for some time. Messrs. Lea Brothers & Co. are to be congratulated on the mechanical part of the production, which is almost faultless.

International Clinics. A quarterly of clinical lectures on medicine, neurology, surgery, gynecology, obstetrics, ophthalmology, laryngology, pharyngology, rhinology, otology, and dermatology, and specially prepared articles on treatment and drugs. By professors and lecturers in the leading medical colleges of the United States, Germany, Austria, France, Great Britain, and Canada. Edited by Judson Daland, M.D. (Univ. of Penn.), Philadelphia, Instructor in Clinical Medicine and Lecturer on Physical Diagnosis in the University of Pennsylvania. J. Mitchell Bruce, M.D., F.R.C.P., London, England, Physician to and Lecturer on the Principles and Practice of Medicine in the Charing Cross Hospital. David W. Finlay, M.D., F.R.C.P., Aberdeen, Scotland, Professor of Practice of Medicine in the University of Aberdeen. Eighth series 1898. Volume iv. Philadelphia: J. B. Lippincott Company. Montreal: C. A. Roberts, general agent for Canada. Toronto: A. P. Watts & Co., 10 College St.

The concluding volume of the 8th series maintains fully the reputation of the clinics. The editors take great pains to supply articles on subjects of the greatest usefulness to the general practitioner. While the ailments of less common occurrence are plentifully exploited, those more commonly met with have the preference. The opening clinic of the present volume is by Dr. Geo. C. Laws, on Glonoinism. It is a most interesting treatise on the nitroglycerin poisoning to which workers in this material are subject. Tracings of the pulse after years of following the trade are presented with short histories of the cases. Professor A. Fournier, of Paris, presents the treatment of the "syphilitic chancre." He does not condemn the excision of the chancre but remarks that the only reason for not doing so is the respect due to certain physicians who have published cases in which they claim to have succeeded in aborting the disease. We do not agree however, with the foregoing. The wound made in aseptically excising the chancre is insignificant, and we have most usually had union by first intention. However, the question is a most unsettled one and open to fair discussion. The advice of not to do too much is most excellent and "spare the patient from the use of iodoform" most appropriate, for reasons that are plain.

Dr. Joseph M. Machien, of Louisville, in speaking of the treatment of ulceration of the rectum and ulceration of the colon says that all ulcerations of the rectum are either common, syphilitic, or tuberculous. This is a point well taken and with Dr. Machien's twenty years of experience should be well considered.

All the clinics are of an unusually high order.

Nervous and Mental Diseases. By ARCHIBALD CHURCH, M.D., Prof. of Clinical Neurology and of Mental Diseases and Medical Jurisprudence in the North-western University, Chicago, etc., etc.; and FREDERICK PETERSON, M.D., Clinical Professor of Mental Diseases in Woman's Medical College, New York; Chief of Clinic, Nervous Department, College of Physicians and Surgeons, New York. With 305 illustrations. Philadelphia: W. B. Saunders, 925 Walnut Street. 1899. Toronto: J. A. Carveth, & Co. Price, cloth, \$5.00; half morocco, \$6.00.

We have here a large octavo volume of 843 pages. This work is gotten up in the elegant style so characteristic of all of W. B. Saunders' publications. The paper, type, illustrations and binding are everything that could be desired.

This covers the entire field of nervous and mental diseases. In this regard it possesses a distinct advantage over many able works that treat of only sections of the work, such as organic or functional diseases of the nervous system, or diseases of the mind. Dr. Church takes the former, and Dr. Peterson the latter portions of the work.

From the reputation of these two authors, one turns to this work with high expectations. It must be admitted at once that, with rapid change of opinion and advance in knowledge that is taking place along the whole line of neurology and alienism, it is not an easy task to produce a book that will be found to be well up-to-date and accurate on all points. It must be said that a careful perusal of this work makes it clear that the authors have left nothing undone to fulfil these two requirements. Lengthy discussions on debatable subjects are carefully avoided. One of the leading features of the work is its directness and definiteness of statement.

The care with which the illustrations have been selected deserves more than a mere passing word. It rarely falls to the lot of the reviewer to speak with so much pleasure of this feature of medical works as in the present case. To take as an instance, fig 19 expresses in a glance what it would take pages to explain. The numerous illustrations giving the attitude and gait of many nervous diseases are very important. This feature of the study of nervous diseases has been far too much ignored in many of our best works. In the section devoted to mental diseases, the illustrations are very typical and helpful.

If anyone wishes to read a masterly description of any extremely difficult question, we would commend to him the article on "Paranoia." One statement at once attracts the attention, where the writer states that the prognosis is absolutely unfavorable. It is not often that we meet with such clear cut

opinions; and yet, when you look at the evolution of progressive systematized insanity, how could it be otherwise than hopeless? Nevertheless, some authors speak of recoveries!

This work should meet with a favorable reception. It possesses the elements requisite to make its way into the confidence of medical readers—lucidity of style, accuracy of statement, and fulness in the treatment of the whole field of neurology.

DUFFERIN UNION MEDICAL ASSOCIATION.

The second quarterly meeting of the Dufferin Union Medical Association was held at Orangeville on Tuesday, May 9th, and was interesting and well attended. The general discussion was principally occupied by the subject of Appendicitis. The next meeting, which was constituted the annual one, will be held at Grand Valley, on the second Tuesday in August, 1899, when a morning and afternoon session will take place.

The following resolutions were passed:

Moved by Dr. Smith, Orangeville, seconded by Dr. Hopkins, Grand Valley, that this Society considers that the time has arrived when the medical profession should receive justice at the hands of the municipalities whose sick and injured indigents call for medical and surgical aid; that the repeated repudiation of just claims for such attendance, even in cases of contagious and infectious diseases, is a disgraceful and dishonorable evasion of duty by township, village and town authorities; that, in order to have this abuse corrected, the matter be brought before the Medical Council by our representatives, and that in the meantime other county and district societies be requested to take such concerted action as may lead to a proper recognition of our rights. Carried.

Moved by Dr. Lewis, seconded by Dr. J. Henry, that it is desirable that interprovincial registration be secured, if the curriculum in all the provinces be made equal to that now obtaining in the Province of Ontario. Carried.

In regard to the use of atropine, for a long time it has been my custom to give a hypodermic injection of atropine and morphine, $\frac{1}{8}$ - $\frac{1}{4}$ grain of the latter and $\frac{1}{12}$ - $\frac{1}{16}$ grain of the former, half an hour before operation. Of course it is impossible to say that it has prevented pneumonia, but it certainly has done good. The patient takes the anesthetic (ether) better, and there is less mucus in the throat.—GRANT BALDWIN.

INTRACEREBRAL INJECTION OF ANTITOXIN IN TETANUS.

Dr. D. Semple, Assistant Professor of Pathology, Army Medical School, Netley, in an article published in the *British Medical Journal* of January 7th, 1899, refers to the following facts, the result of a series of experiments on animals, by Roux and Bérrel, and verified by himself at Netley, and at the Pasteur Institute at Paris :

1. Tetanus is caused by the absorption of a toxin elaborated by the tetanus bacillus at the site of inoculation. Here the bacilli multiply, and produce a very strong toxin, which, after absorption, is taken up by the cells of the central nervous system, is fixed there, and gives rise to the characteristic spasms

2. Hypodermic injection of the toxin into susceptible animals will cause the disease, though bacilli are not present.

3. The toxin reaches the central nervous system by two paths, one part, directly by the nerves, causing spasms near the seat of injury at an early date. The other part passes to the central nervous system by means of the blood stream, being fixed in the nerve cells. This fixation takes place earlier in the spinal cord than in the higher nerve centres.

4. If tetanus antitoxin be injected hypodermically into a healthy animal, it acquires passive immunity, and can resist subcutaneous or intravenous injection of large doses of tetanus toxin. However, the animal is not immune to a small dose of tetanus toxin injected into the brain substance, but on the contrary it readily develops cerebral tetanus, and dies.

5. An animal suffering from fully developed tetanus cannot be cured by hypodermic injection of tetanus antitoxin. The toxin has already been taken up by the cells of the central nervous system, and these cells do not take up the antitoxin from the blood, and are not influenced by it. In this case the toxin may invade new areas under the false protection of the antidote, nerve cell after nerve cell being involved. (On the other hand, animals in the early stage of tetanus can be readily cured by intracerebral injection of a small amount of antitoxin.

Conclusions.—If tetanus is suspected, but symptoms have not appeared, subcutaneous or intravenous injection of antitoxin confers passive immunity, and is a certain preventative. If symptoms have appeared, this is not sufficient to cure or prevent the spread of the disease, for the central nervous elements have not the same affinity for the antitoxin as they have for the toxin. For this reason the antitoxin does not reach the affected nerve cells in the lower centres, and the higher nerve centres, which have not as yet taken up the toxin, are not

immunized, therefore the disease progresses. The only way to confer immunity on the higher nerve centres is to inject the antitoxin into the substance of the brain.

Chauffard and Quenin, of Paris, were the first to adopt Roux and Borrel's method of intracerebral injection of tetanus antitoxin in a case of tetanus in man, in April, 1898. The case recovered. Over twenty cases have been treated in this way in and near Paris since that time, with encouraging results. Dr. Semple does not state how many recovered.

In Dr. Semple's case, on November 16th, the patient developed symptoms of tetanus. The masseter muscles and the muscles of the neck were contracted, and those of the abdomen slightly so. On the 17th spasm of the jaw muscles was marked, and there were also spasms of the muscles of the legs and arms. On the 17th at 9 p.m., $2\frac{1}{2}$ c.cm. of doubly strong antitetanic serum were injected into each frontal lobe of the brain, and 20 c.cm. of antitoxin were injected by hypodermic into the flank. On the 18th the condition was unchanged, and 20 c.cm. were given hypodermically; on the 19th the condition was about the same, and 20 c.cm. were given hypodermically; on the 20th the spasms were less marked; on the 21st there was more improvement; on the 22nd he could open his mouth without causing spasm; on the 23rd the muscles of the jaw and neck were free from spasm, but there were twitchings when he heard a noise; on the 30th he was able to be out of bed, but had slight spasm of the arms on exertion. He was weak and anemic. He had no brain symptoms, ate and slept well. The temperature was practically normal throughout, and pulse and respiration regular.

The intracerebral injection immunizes the higher nerve centres before the toxin has become fixed in the nerve cells. Twenty c.cm. are given hypodermically for two, three or four days, according to circumstances, and have the effect of rendering the blood antitoxic. The toxin, therefore, as it becomes absorbed from the source of supply, is neutralized as soon as it reaches the blood stream.

Description of the Operation.—The hair is cut, the anterior part of the scalp shaved and the skin made aseptic. The patient is anesthetized. An imaginary line is drawn from one auditory meatus to the other; another line from the base of the nose intersects this at right angles, and a third from the outer angle of the orbit to the point where the first two lines intersect. The middle point of this last line is chosen as the site of operation. An incision from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch is made down to the bone. A small hole is drilled with an Archimedean drill, with a movable collar, so as to regulate the depth to which it

penetrates. A special syringe, with a screw piston and a needle with a rounded point and about two inches in length, containing $2\frac{1}{2}$ c.cm. of double strength antitoxin, is inserted through the hole and straight into the brain substance as far as it will go. The piston is screwed down very slowly, so that the fluid enters the brain substance drop by drop, to avoid breaking up any brain tissue. About ten minutes is required for the injection. The needle is withdrawn slowly, the edges of the wound drawn together by two or three stitches, and sealed with collodion and cotton wool. The same operation is repeated on the other side.

[The needle with a rounded end would not transfix a vessel; a sharp-pointed one might.]

HEPATIC INSUFFICIENCY.

M. G. Carrière, Professor in the Medical Faculty of Lille discusses at length the above subject in the *Gazette des Hôpitaux* for January 7th, 1899. He states that the functions of the liver are the formation of urea, sugar, bile, the arrest of poisons, the arrest of microbes, a blood-making power, and an unknown function in the form of an internal secretion.

Hepatic insufficiency may follow two different modes. It is quite certain that the diseased hepatic cells lose their functions wholly or in part, as in atrophic cirrhosis. In the second place the work imposed upon the hepatic cells may be greater than their powers. In this case there is a relative insufficiency, as when there is more sugar taken than the liver cells can fix, there results a glycosuria.

Clinically, one can recognize three forms of hepatic insufficiency: (1) Latent hepatic insufficiency; (2) Minor hepatic insufficiency, or minor hepatitis; (3) Grand hepatic insufficiency.

1. In a great number of cases of latent hepatic insufficiency the person is not in the least degree aware of its existence. It is only on the occasion of some passing intoxication, as a medicine or alcohol, or on the occasion of some infection that the disturbance becomes manifest. It is only by a thorough study of the urine that we can find out these derangements of the liver in its ureagenic, biligenic, glycogenic, and poison-arresting functions. In this way these latent insufficiencies can readily be revealed, as has been so well shown by Hanot.

2. The minor hepatic insufficiencies often reveal themselves to thorough interrogation, especially by an assemblage of little signs. Comparing these signs to those of Bright's disease, we may speak of them as the little signs of hepatic insufficiency. There is an anorexia, sometimes complete, sometimes only