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LEVULOSURIA, AND ITS SIGNIFICANCE IN THE DIAG-
NOSIS OF HEPATIC CONDITIONS.

BY

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The functions of the liver are numerous and the testing of them, clinically, is most complicated and difficult. Many special workers have "sought in vain," one might say, to discover satisfactory methods by which the cell activity of this organ might be determined. The correlation of the chemical findings with organic change is a task not less difficult and towards this most desirable result many investigators are energetically striving.

When one reflects seriously upon the results obtained by the routine methods applied, one must conclude that the ordinary clinical examination of the liver affords but little that is conclusive concerning that organ. The patient is jaundiced and the stools are acholic. These signs may well arise from several causes outside the liver; or again, the liver margins are felt or not felt, in many instances on account of surrounding conditions, or on account of displacement. There may be ascites. Hepatic causes may have no part in this; and so one might multiply instances illustrating the uncertainty of results in the ordinary examination made upon this organ.

More and more with the advances made in scientific medicine, it has not only become essential that the functions of the various organs be understood and determined, but it is becoming possible to do so. Among many function tests applied to the liver, those for the carbohydrate metabolism seem to be most satisfactory, and of these the levulose test stands out with most promise. It has the advantage of being easily applied, and while no test by itself is conclusive, yet, judged by the accumulating evidence regarding it, one may at least say that it is very helpful in answering the question concerning the functional activity of the liver cells.

The purpose of the observations made during the past two years in the wards of the Royal Victoria Hospital has been to work over a por-

tion of this field of difficult diagnosis already opened up, and thus to test the truth, or otherwise, of what has been done. The few notes which it is my privilege to present to this meeting to-day, are but a record of these observations and a comparison of the results of other workers.

Two statements should be made concerning the test in order to show the basis of its applications. In 1901, Hans Sachs published the results of his experiments showing that the liver alone was able to convert levulose into glycogen. Those animals with extirpated livers when given levulose, excreted it unchanged. Further, upon experimental grounds, Strauss and others consider that 100 grms. of levulose is readily dealt with by the majority of normal individuals, no trace of it being found in the urine afterwards. There is, however, according to these observers, a percentage of normal—or at all events apparently normal—individuals, varying from 1 to 15 per cent., in whom alimentary levulosuria occurs on taking 100 grms. on a fasting stomach.

We have here briefly summarized and grouped the cases studied:

GROUP I.

With History or Physical Signs Pointing to Hepatic Disease.

Case I.—No. 15,533.—Male, aged 16, Admitted for some signs of general gonorrhœal infection, pain over the plantar fascia and sacral region, pain in the left side of the abdomen and down the left leg. The liver one and a half fingers below the costal margin, spleen readily palpable, no jaundice. Levulose test positive, about $\frac{1}{2}$ per cent.

Case II.—No. 15,413.—Female, aged 51. Jaundice, short illness of three months with severe abdominal pain in the upper half of the abdomen, no vomiting. Loss of weight in two years from 155 to 122 pounds, no history of alcohol or syphilis, bile and albumin in the urine. No fever or ascites. At first the liver was difficult of palpation; after two or three weeks in the hospital one felt that it was definitely made out and enlarged. The levulose test was positive, $\frac{1}{2}$ per cent. being present.

Case III.—No. 15,416.—Male, aged 40. Pulmonary tuberculosis, myocarditis, jaundice, enlarged liver and spleen, occasional attacks of diarrhœa; œdema of the legs. The test was positive from the first.

Case IV.—No. 14,799.—Female, aged 58. Ill several months with attacks of diarrhœa; no pain or vomiting, no history of alcohol or syphilis. The liver and spleen were not enlarged; stomach was displaced. The test was positive in the second hour specimen.

Case V.—No. 14,227.—Male, aged 47. Complained of loss of appe-

tite, morning vomiting, abdominal pain, and had been ill for about one year with so-called digestive troubles; liver was enlarged and tender, the spleen was not palpable; the face was muddy. There was a history of alcohol; there was dulness in both flanks. The test was positive at the end of the first hour.

Case VI.—No 14,571.—Male, aged 40. Gastric disturbances for some time, abdominal distress, dulness in both flanks, slight jaundice, with bile in the urine; liver enlarged below the costal margin. The test was positive from the first hour.

Case VII.—No. 15,343.—Male aged 49. An indefinite history of tuberculosis many years ago. Recent illness of nine months with slight jaundice, indigestion, and fever. No alcoholic history, no syphilis. Abdomen distended and other signs of fluid. The test was positive in the first and second hours, $2\frac{1}{2}$ per cent. of levulose in the second specimen.

The patient died some three or four weeks after the test was made, but no autopsy was performed.

Case VIII.—No. 15,161.—Male, aged 45. History of alcohol to excess for several years. When under treatment two years before the test was made, the liver was $2\frac{1}{2}$ inches below the costal margin, tender and rather hard, patient was somewhat jaundiced. During this period the patient had been an abstainer and had complained of loss of appetite. There was often considerable epigastric distress, particularly three or four hours after food. The liver was felt just beneath the costal margin. The levulose test was positive in the second, third and fourth hours.

Case IX.—No. 15,242.—Female, aged 41. Diarrhoea was the chief symptom. The patient was a gin drinker for some two years or so and lost weight. There was no jaundice. The test was positive in the second hour, $\frac{1}{2}$ per cent. of levulose being present.

The patient improved and no further observations have been made in the past three months.

GROUP II.

Cardiac Cases with Infections.

Case X.—No.—Female, aged 48. General oedema, ascites, history of alcohol, considerable irregularity of the heart; no albumin in urine. Doubtless a case of myocarditis. Levulose test negative.

Case XI.—No. 15,406.—Male, aged 10. Streptococcus, septicæmia, blood culture positive; malignant endocarditis involving both mitral and aortic valves. Mitral stenosis and aortic insufficiency; fever; no albumin and no casts when the test was made. Spleen and liver both enlarged. Test negative.

Case XII.—No. 15,362.—Female, aged 28. Chronic mitral and tricuspid insufficiency. The liver enlarged and pulsating; slight icterus, ascites; no albumin when the test was made. Test negative.

Patient went home improved.

Case XIII.—No. 15,287.—Male, aged 54. Alcohol for many years. Aortic endocarditis, myocardial degeneration, passive congestion of the liver and spleen, the liver large and tender. Levulose test negative.

Case XIV.—No. 15,221.—Male, aged 15. Chronic mitral and aortic disease, enlarged liver, ascites and hydrothorax, slightly jaundiced. The levulose test was positive in the second sample giving $\frac{1}{2}$ per cent.

The autopsy showed a nutmeg liver and cardiac spleen.

GROUP III.

Jaundice and Malignant Disease.

Case XV.—No. 14,575.—Male, aged 19. For several months had sign of abdominal disease as shown by enlargement, tenderness, ascites and pain. Needed frequent tapping; a mass was discovered in the rectum. The test was applied and proved to be positive first, second and third hours after ingestion.

Patient died. Extensive cancer of the colon with metastases in the liver, omentum, etc. The case is one of unusual character occurring in a youth of 19. Patient said that he was well until July, 1909—died on December 25th, 1909. No bile in the urine.

Case XVI.—No. 15,251.—Male, aged 39. Recent illness, severe abdominal pain; liver edge not felt, doubtful diagnosis. Test was negative. Operated on by Dr. Bell. Liver found normal; pancreas thickened and hard.

Case XVII.—No. 15,484.—Female, aged 11. Headache, nausea and abdominal pain beginning about ten years ago, succeeded by jaundice. The history given by the patient's mother shows that the child had always been ailing, complaining of abdominal cramps, headaches and nausea almost every week, necessitating her losing some time at school. There was deep jaundice; the liver was enlarged, and somewhat irregular. The test was positive in all four specimens examined; 75 grms. only of the levulose was given on account of age.

Case XVIII.—No. 16,990.—Female, aged 52. Protracted gastric disturbance, no jaundice. Cancer of the liver and gall bladder was diagnosed. At operation the diagnosis was established, there was certainly cancer of the gall bladder; the liver was enlarged. The test was positive.

Cas XIX.—No. 14,634.—Male, aged 64. A long period of indigestion and jaundice, with attacks of abdominal pain, more or less severe.

Intense jaundice. Loss of weight and considerable weakness. Abdominal signs were those of enlargement in the region of the liver, but there was no ascites. Stomach gave no free hydrochloric acid. The whole history suggested gall stones or malignancy and the decision was in favour of malignant disease. Test was negative.

The subsequent course of this case proved the incorrectness of the diagnosis at all events; it is highly probable, from the clearing up of the jaundice and increase in weight, that the patient suffered from gall stones.

Case XX.—No. 16,945.—Female, aged about 55. Some 15 or 20 years of gastric disturbance, the abdomen full and enlargement in the region of the gall bladder and liver; jaundice. The test was positive.

GROUP IV.

Miscellaneous.

Case XXI.—No. —.—Female, aged 35. History of several months of excesses in gin drinking inducing acute multiple neuritis; blue line on gums. Test negative.

Case XXII.—No. 14,992.—Male, aged 57. The patient had complained of "stomach trouble" for several years. There was no history of alcohol or syphilis; liver was not enlarged. The patient was the subject of *tabes dorsalis*. The levulose test was negative.

Case XXIII.—No. 15,433.—Female, aged 40. History of pleurisy and neuralgia; gin and whiskey drinking admitted. For several years her liver and spleen attracted, on account of their size, the attention of the physicians who examined her. The skin was muddy, there was no jaundice, no albuminuria; there was latent tuberculosis in both pulmonary apices. The test was negative.

Case XXIV.—No. 14,460.—Female, aged 54. Patient was admitted to the hospital as a case of diabetes. There was no history of alcohol; there had been several miscarriages. The patient complained of general pains in the back, abdomen and breast; some numbness in the fingers of the right hand; she had a big abdomen. The liver was not enlarged although there was slight ptosis. When admitted on the 6th of August, the percentage of sugar dextrose was $\frac{1}{4}$ th per cent., and this increased on full diet to 5.6 per cent. Thereafter, there was a gradual lessening until August 19th; the test for dextrose was negative. During this time the patient had been dieted and given codein. After four days of sugar-free urine the levulose test was tried and proved positive in four specimens.

Case XXV.—No. 15,181.—Male, aged 75. This patient, while ad-

mitting that he used to drink alcohol steadily, made no complaints suggestive of hepatic disease. He was under treatment for sacro-lumbar pains and was given the test largely for the purpose of seeing how the liver of an old man would deal with 100 grms. of levulose. The test was negative.

Case XXVI.—No. 15,197.—Male, aged 19. This was a doubtful case of tuberculosis, with dilated heart and ascites. There was a question whether it was the omentum or liver which one felt in the upper part of the abdomen. The levulose test was negative.

Analysis of the Cases.

There were 26 patients in all subjected to the test, and in their analysis we have striven to group them together, mainly from the clinical diagnosis.

Our first group consists of 9 cases in which either the clinical history or the physical signs, and in some instances both, suggested definitely hepatic disease.

In the second group are to be found 5 cases where the patients were the subject of advanced cardiac disease, and by glancing over the summary of each case one may readily discover the gravity of the lesions.

The chief characteristics of those cases comprising the third group, 6 in number, are protracted jaundice, signs of malignant disease, and digestive disturbances.

Into our fourth group we have thrown together 6 cases, and termed them miscellaneous. We have thus applied the test in a variety of conditions comprising several diseases, certain toxic states, and senility.

In studying these cases a little more closely it will be observed that our first group of 9 presents an interesting study, the results of which confirm the conclusions already arising from this test,—that it was usually positive in cirrhosis cases. Of these 9 all gave the positive reaction. Six of these it would appear are pretty definite cases of cirrhosis of the liver, Nos. 3, 5, 6, 7, 8, and 9. From the reaction and from the physical finding it seems probable that cases Nos. 8 and 9 are cases of early cirrhosis. This statement is based upon the tests becoming positive only in the second hour, and upon the history and appearance and complaints of the patient. In cases No. 1, 2, and 4, we must admit that there is doubt,—considerable doubt—and from the result of the tests these cases might be classified as “hepatic insufficiency,” which should be followed up.

The second group are all negative, with one exception, No. 14, which is of particular interest. This patient died from chronic endocarditis

and the results of the autopsy, so far as concerns our argument to-day, shows definitely an early fibrosis, as described by Dr. Adami. I cannot do better than quote his description. In his report upon the microscopic findings in this case Dr. Adami says:

"The sections exhibited a well-marked grade of passive congestion, with atrophy involving the central third of the lobules. The outer third showed very little fatty infiltration of the cells, hence this was not a typical 'nutmeg liver.' Some cells showed a fair number of small, rather shrunken looking, fat globules. There was more fatty infiltration in the cells of the middle zone bordering upon the areas of atrophy. In addition to congestion there was a marked fibrosis of the portal sheaths, with apparent multiplication of the bile ducts, showing in some places a small celled infiltration, but in general being of an older type with fully formed connective tissue. This fibrosis was sharply confined to the portal sheaths. One mass was so large as to take up more than two fields of the high power."

Of the third group, comprised of 6 cases, four show positive reactions. In two of these Nos. 18 and 20, there is malignant disease of the liver and gall bladder, the liver being doubtless involved secondarily. The third, No. 15, giving a positive reaction, also showed extensive metastases in the liver and omentum. To No. 17, a child of 11 years, 75 grams instead of 100 grams were given, and a positive reaction was obtained in the four hour specimens. The remaining two cases, Nos. 16 and 19, showed the liver to be manifestly normal at operation, and subsequently as judged by the course of the case.

The fourth group contains a number of cases, 6 in all, on which the test was tried, as in previous cases, for diagnosis, but little if any evidence being present in the history that we were dealing with hepatic disease. They comprise alcoholism with its resulting neuritis, a chronically enlarged liver and spleen of several years standing, tabes dorsalis, senility, alimentary glycosuria, and tuberculosis. These cases gave the negative reaction with the exception of No. 24, the case of alimentary glycosuria, and this we would classify as another of "hepatic insufficiency."

We have already said that the application of the test is simple. The urine of the patient is examined for sugar. In the morning after a night of fasting, and after emptying the bladder of the night urine, the patient is given 100 grams of levulose in about 500 cc. of water or weak tea, and the urine is then examined every hour until four specimens are taken. It is usual to apply three tests, and some prefer four, to determine the presence of levulose. They are, the Resorcin test, Schwanoff,

Fehling's test, or that of Safranin, and the polariscope. The fermentation test may also be applied.

Of the 26 cases which form the basis of this paper there were 15 positive and 11 negative results.

Positive: 6 Cirrhosis.

4 Cirrhosis probably (1 cirrhosis with jaundice in a child of 11 years.

1 Cirrhosis with heart disease.

2 Cancer of the gall bladder and liver.

1 Cancer of the liver, metastatic.

1 Alimentary glycosuria (hepatic insufficiency).

15

Negative: 4 Cardiac cases with passive congestion.

2 Jaundice with pancreatitis and gall stones.

1 Spleen and liver enlarged, chronic.

1 Tabes Dorsalis.

1 Alcoholism.

1 Tuberculosis.

1 Senility.

11

Results of observations already recorded up to November, 1909, as reported by Holweg, to which Goodman's figures are added:

	CASES.	POSITIVE.	NEGATIVE.
Liver cirrhosis	102	93	9
Jaundice with gall tones	5	2	1
Catarrhal jaundice	9	7	2
Luetic liver	16	11	5
Chronic obstruction of common duct	8	8	0
Passive liver congestion	23	1	22

Many more might be added, but they comprise for the most part a few observations on amyloid liver, malignant growths, both primary and secondary, affording rather conflicting results.

Our results accord pretty closely with these figures,—to take but two classes of cases:

	CASES.	POSITIVE.	NEGATIVE.
*Cirrhosis of the liver	6	6	0
Cirrhosis of the liver?	4?	4	0
Cirrhosis of the liver with heart disease	1	1	0

[*In view of the percentage of positive results in cirrhosis, it may be explained that the cases were all selected as such upon clinical evidence.—W. F. H.]

This is 100 per cent., but there are four cases which are doubtful; when these cases are excluded the percentage remains the same.

The percentage of negative results in passive congestion is also high, corresponding with those of other observers.

In closing, it would seem that the following observations might, at least partially, express the present status of the levulose test:

(1) The levulose test is positive in a high percentage (75-100) of cirrhosis cases.

(2) This test may be considered as determining the presence of cirrhotic processes in the liver where passive congestion is the chief clinical feature.

(3) It is suggested by this study, and that of others (Hohlweg), that the test should be more carefully considered in its relation to malignant disease associated with jaundice. It may be possible to distinguish the obstruction of gall stones from the obstruction due to malignant disease.

(4) This test—like all others of the kind (bio-chemical)—can be of use only when the whole case is considered.

(5) It is suggested that the term "hepatic insufficiency" might properly find a place in the columns of diagnosis when this test is positive.

My thanks are due to Dr. Bruere of the Clinical Laboratory, and to several house physicians, among whom Dr. Landry and Dr. Carney should be mentioned.

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REGENERATION OF SHAFT OF TIBIA FOLLOWING EXTENSIVE OSTEO-MYELITIS.

BY

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The following are brief notes taken from the hospital report of a somewhat unusual case of the regeneration of the shaft of the tibia: H. L., aged 12, was admitted to my service at the Montreal General Hospital on March 11, 1908, suffering from a large swelling in the

front of the right leg, and a small swelling in the right wrist and forearm. Four weeks before admission, without any history of previous illness or injury, pain and swelling developed in these two regions. Family history shows mother and one sister died of tuberculosis, (one sister had "rheumatism" two years ago), and the father was suffering from tuberculosis at the time of admission.

Patient is a delicate, emaciated boy, suffering from grave constitutional disturbance. The following day under ether anaesthesia, a free longitudinal incision over the front of the leg was made, and a large quantity of pus was set free, when it was seen that the diaphysis was devoid of periosteum, virtually separated from both the upper and lower epiphyses and was removed. Involucrum was already present. After disinfection with pure carbolic acid and alcohol, the part was packed with iodoform gauze and limb placed in a plaster cast, leaving a fenestra over the wound.

The right wrist was opened, curetted, disinfected and packed with gauze. Culture showed staphylococcus pyogenes aureus.

Eleven days later, on March 23rd, under ether anaesthesia, the cavity was disinfected, the periosteum separated from subcutaneous tissue and brought together at a few points with catgut sutures, with a view to reproducing the original circular form of the periosteum. The periosteum was then filled with Mosetig-Moorhof's plumbage. The skin being brought together over the surface, provision was made for drainage by the introduction of iodoform gauze at the upper and lower margins, carried down to the epiphysis. The limb was put in a plaster cast supplemented with a weight and pulley extension apparatus, in the hope that this might aid in retaining the normal position of the limb during the process of repair, thus preventing curving due to the fibula continuing its longitudinal growth, as well as the lack after the removal of the sequestrum.

Drainage was kept up for many months, small particles of iodoform plumbage being washed out from time to time. Patient was discharged on August 12th in good condition with his limb in a plaster cast. There is slight antero-posterior movement in the middle of the shaft on the new growth. Later he returned when it was seen that complete regeneration of the bone had taken place, although the central portion was small. Sometime later, while at play, he fractured this point of the new bone and was readmitted to the hospital on December 5th, 1908.

On December 7th, under general anaesthesia I dissected out the ends which I found to be rounded, and after freshening the surface by sawing, brought the parts together with chromic-iodine catgut. It was noted

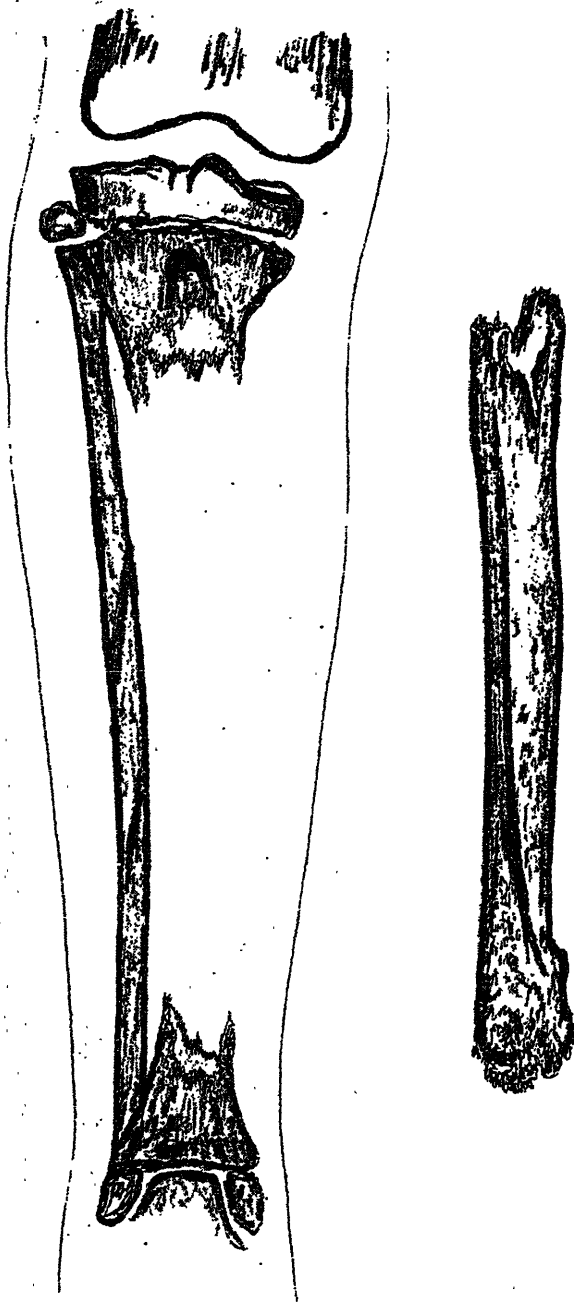


DIAGRAM No. I.—March, 1908. After operation, M.G.H.

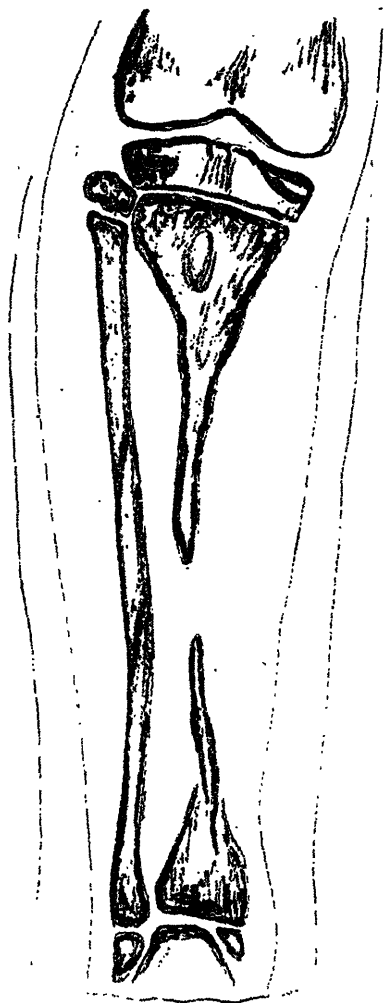


DIAGRAM No. II.—May 30, 1908.
X-ray No. 486. M.G.H.

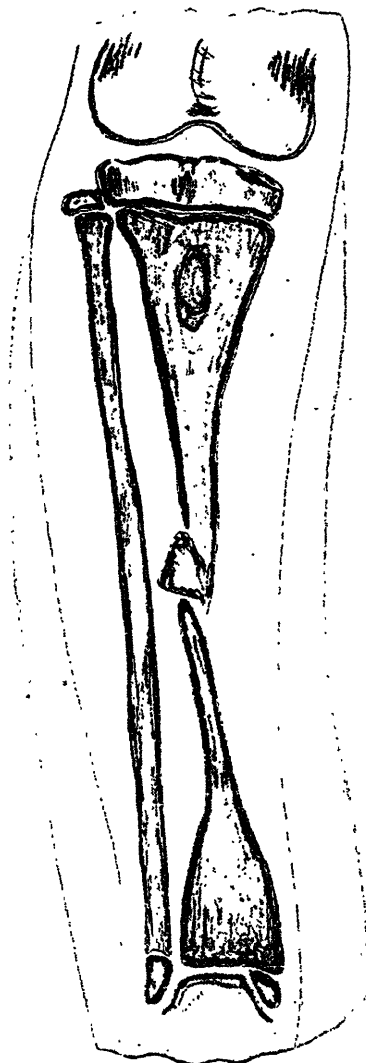


DIAGRAM No. III.—December 7, 1908.
X-ray No. 1408. M.G.H.

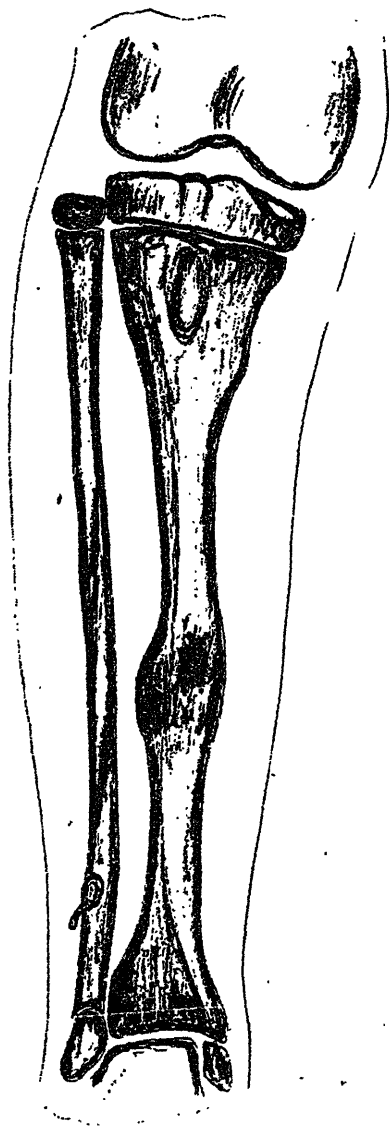


DIAGRAM No. IV.—June 21, 1909.
X-ray No. 824. M.G.H.



DIAGRAM No. V.—December 24, 1909.
X-ray No. 2069. M.G.H.

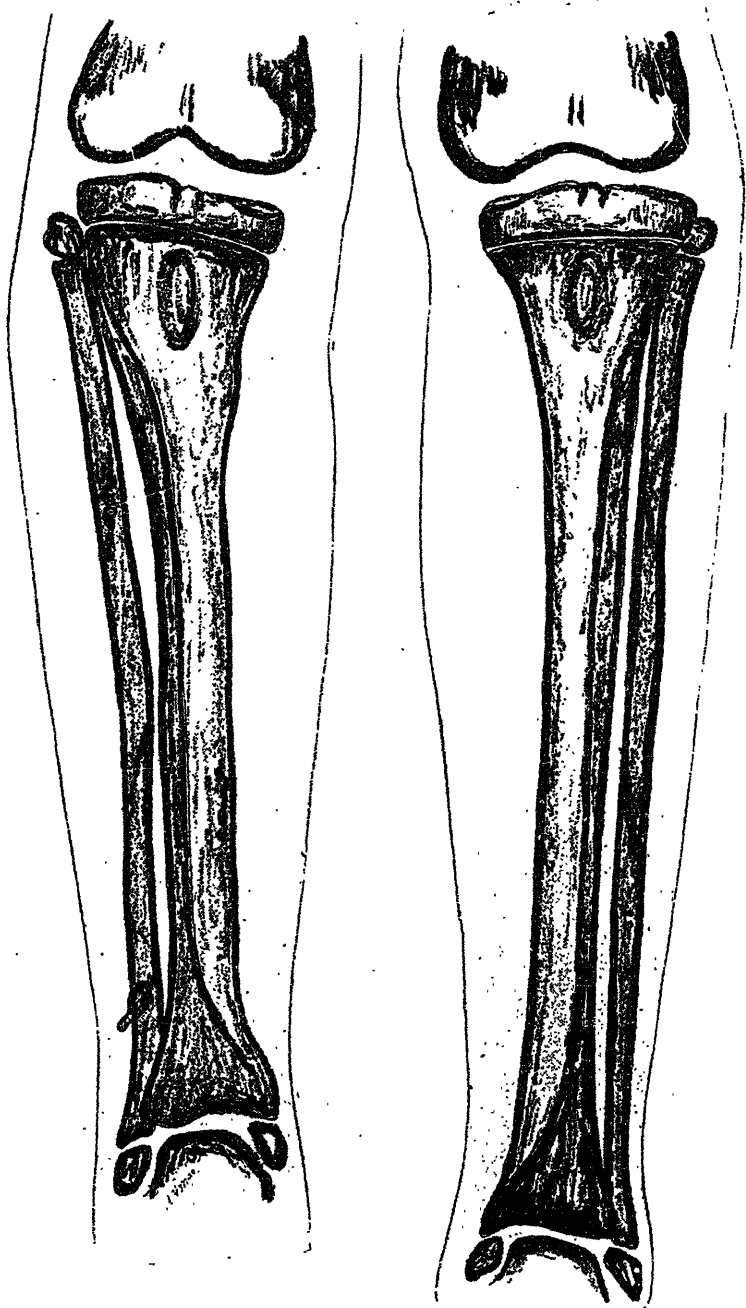


DIAGRAM No. VI.—January 26, 1910. X-ray No. 217. M.G.H.

in sawing the bone that there was no medulla, and that the bone was exceedingly dense and difficult to saw. It was necessary to make an independent opening over the lower part of the fibula and resect a small portion of that bone before the two portions of the tibia could be brought together. A sinus at the upper end of the original incision being present, this was disinfected and a small drain introduced. The limb was put up in plaster and dressing was changed from time to time.

On January 3rd, 1910, the left leg was found to be $14\frac{1}{4}$ inches long, and the right leg $12\frac{1}{2}$ inches. Circumference at a point six inches above internal malleolus—left leg $8\frac{3}{4}$ inches, right leg $9\frac{1}{4}$ inches.

The destruction of bone and resulting deformity following acute osteomyelitis is sufficiently well known to warrant me in presenting the result of the above case.

Without going into the subject of osteomyelitis in general, I may point out that the disease most frequently shows itself in affections of the femur, the second in importance being the tibia. It occurs most frequently in males, and in the larger percentage of cases before the ossification of the bone. The infection is most commonly caused by the staphylococcus pyogenes aureus, although mixed infections are seen not infrequently associated with the tubercle bacillus.

A beautiful illustration taken from Loxor, reproduced in the American practice of surgery, in the article on inflammatory infections of bone by the lamented George A. Peters, of this city (Toronto), gives a very clear view of the reasons why this disease should cause such destruction when it attacks the long bones. It is because a great deal of the arterial blood supply of the long bones ends in terminal arterioles, and there is not that free anastomosis which is present in many other parts of the body. The case under discussion clinically conforms to the above theories in almost every particular. It shows that the head of the bone, where the blood supply is best and where the periosteum is bound down to the bone or cartilage, resisted the invasion of the disease. It also shows that the shaft was quickly destroyed. During the process of repair it further shows that the latest part of the shaft to repair was at a point half way between the upper and lower epiphyses. You are, no doubt, aware of the various methods which have been adopted, from the transplantation of a whole portion of bone, to the bone clippings used many years ago by Sir William McKeown. Plaster of Paris, catgut, sponge and other materials have been used with varying success and in many instances with total failure.

The case under discussion is a good illustration of the success of the plumbage method. This is the first time I have used extension by weight

in combination with plumbage, with the object of preserving the shape of the limb, and by an attempt at control of the shape of the new formation of bone. I have never seen any reference to this combination of treatment. It will be noted from the X-Ray plates that each epiphysis contributes equally to the development of new bone.

I hope to be able to keep record of this case with a view to learning if the new bone will increase longitudinally in equal proportion to that of the opposite limb, also if Nature will provide for part or whole of the $1\frac{3}{4}$ inches difference in length as shown by the last measurement six months since.

THE SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE.

BY

FRANCIS J. SHEPHERD, M.D., C.M., LL.D., F.R.C.S.E. (Hon.)

The treatment of Graves' disease by surgical measures is now considered by most surgeons and many physicians as the only rational method of procedure. If one believes the theory of Moebius, that the disease is due to excessive secretion and absorption of thyroid juice, then it is most logical to remove the cause. Kocher holds that the failure of cure after operation is due to the fact that not enough thyroid tissue has been excised. Physicians assert that in ten per cent. of cases the thyroid is not enlarged, and that in these cases surgical treatment would be of no avail, but the evidence is only based on visual observation and palpation. Now, in several cases on which I have operated, the thyroid has been apparently of a very small size, but on opening up the neck a large mass of thyroid was found beneath the sternum, and this was not suspected before operation. Again, cases of Graves' disease, where the gland has developed degenerative changes, have changed into myxœdema.

I do not advocate operation in every case; for instance, in advanced cases, where secondary changes have taken place and where there are temperatures, vomiting, diarrhœa, great restlessness, excessive tachycardia, œdema, and considerable dilatation of the right heart, treatment by other than operative measures should be advised. No case should be operated on until the surgeon has had it under observation for some time and the patient has been carefully observed and the more urgent symptoms have been allayed by rest, ice-bags, etc. Crile believes that "psychic excitation" is the most dangerous factor in operations for Graves' disease, and is the chief cause of the hyperthyroidism from which patients suffering from this affection die after operation. To avoid this excitation, after having obtained from the relatives and friends leave to

operate, he does not tell the patient he is going to operate, but some days before operation he makes the patient inhale every morning some essential oil (such as eucalyptus) in the inhaler, at the same time applying to the neck antiseptic dressings. On a given morning, having previously given a hypodermic injection of morphia and atropine, he substitutes an anæsthetic for the essential oil, and thus the patient undergoes operation without any previous knowledge of the fact. I have tried this method in a number of cases and have been much pleased with it.

Another very valuable suggestion has been made by Charles Mayo, which I have found of great use, namely, to avoid the toxæmia following operation, saturate the patient with water, by mouth, continuous irrigation through the rectum, or even by large subcutaneous injections of normal saline.

In apparently the most favourable cases of true Graves' disease the operation is not without danger. In cases in which the operation has been most successful, within 24 hours, toxæmia, or hyperthyroidism, may appear. This is manifested by the tremendous pulse rate, restlessness, the great nervous excitement, high temperature, and sometimes delirium, followed by death in 24 hours. Even flooding the patient with saline is of no avail. In other cases, danger from loss of blood and absorption of the toxic blood lessens the chance of recovery of the patient. In the very vascular forms, accompanied by great nervousness, excessive tachycardia, and a feeble heart, operation had better not be undertaken.

As to the anæsthetic, for some time past I have used a mixture of Ether and Chloroform, 2-1. General anæsthesia administered by an expert need not be dangerous. Local anæsthesia I have not found satisfactory. In Graves' disease it increases the psychic excitation, which every operator is so anxious to avoid. If there be extensive heart lesion, and it is determined to operate, local anæsthesia might be practised, but in such cases operation had better be avoided altogether.

Other methods of operation than excision have been advocated for the cure of Graves' disease, such as ligature of the four thyroid arteries, exothyropexy, or the exposure of the thyroid without excision, and excision of the cervical sympathetic, as advocated by Jaboulay. Exothyropexy has been abandoned, and excision of the sympathetic has only relieved the exophthalmos, the tremors and tachycardia persisting. Ligature of the four thyroids has been proved almost as dangerous as excision of the gland, and not nearly so efficacious. But ligature of two or more thyroid arteries has been practised as preliminary to excision with success.

Having determined on operation, the patient having been suitably

prepared, and half an hour before operation a hypodermic injection of morphia and atropine given, an anæsthetic is administered by a skilled anæsthetist and the operation performed. I need not go into details of operation, but should advise that it be done rapidly; that any bleeding point should be carefully secured, for much bleeding is dangerous, chiefly on account of the absorption of the toxic blood, and that the parathyroids be left in situ as far as possible, though, personally I have never seen a case of tetany follow even where these have been disregarded, yet such cases are occasionally reported. It is my practice to secure the superior thyroid artery, turn the gland over, and secure the inferior thyroid, and then remove the lobe of one side carefully without too much handling. It is my custom to remove one lobe and the isthmus, and, if the other lobe is much enlarged, to ligature the opposite superior thyroid and perhaps remove part of the remaining lobe. Having sutured the divided muscles, the wound is closed with drainage; this I continue for from 24-48 hours. Immediately after operation, rectal irrigation is begun, and often, in addition, I use large subcutaneous injections of salines.

If the time for operation is properly chosen and not delayed too long, the recovery of the patient is the rule. The fatal cases, which are very distressing, are those in which, previous to operation, there has been temperature, great excitability, and perhaps delirium, with secondary changes usual in cases in which the disease has been of long duration. If all cases are not cured by operation, all are benefited. Some cases after a year or two relapse temporarily and then fully recover; others come to a second operation and more of the gland is removed with benefit.

The first symptom to be relieved after operation is the tachycardia, and if the heart is not too severely damaged it recovers completely. The exophthalmos is slow to disappear; the gastro-intestinal symptoms are almost immediately improved, the patient gains weight, and the depression and melancholia quickly disappear, and the patient after a few months to a year feels capable of resuming occupation and intellectual effort is a pleasure rather than a pain. In one case, however, where all the prominent symptoms disappeared soon after operation, the repression and melancholia persisted, and although the patient went home and resumed her household duties, a few months later I heard she had put an end to her life by hanging. Another case, operated on after years of invalidism, was soon as well as ever, being able to climb hills and attend to her usual occupation without effort. Two years afterwards the portion of the gland that was left began to enlarge and nervous symptoms reappeared, tremors, tachycardia, emaciation, etc. She wrote

me she was coming back for further surgical treatment, but I heard no more of her for three years, when one day she walked into my consulting room a perfectly well-nourished girl, enjoying life and apparently in perfect health. There was no trace of thyroid enlargement, and she told me the relapse lasted only a few months, and that with rest all the nervous symptoms disappeared. These temporary relapses are not uncommon, but they gradually become less severe and finally disappear altogether.

The cases referred to, in which operation had been performed, and in which the risk is considerable, are those which have always been first under the care of a physician and have undergone prolonged medical treatment, cases in which no one has any doubt as to the severity of the disease, and many of these patients are totally incapacitated from performing any work at all. These cases are the ones which give the surgeon grave cause for worry. In all such cases I have operated on (in the neighbourhood of 50), which recovered from the operation, a cure or great improvement resulted. In two cases in which relapse occurred, a second operation was performed with complete relief to the patient. Several relapsed and got well without operation. Others have after a year or more completely recovered and some have married and still remained well. Some of these cases have been operated on as many as 15 years ago. In no case have I seen any tetany, notwithstanding that in early cases the parathyroids have been quite disregarded. In some cases the parathyroids have been found imbedded in the gland, or removed with one-half, and yet no ill results followed. I may perhaps have been fortunate, but such is the case that in the removal, partial or complete, of over 200 goitres, I have never seen tetany, and in only one case, and that one of carcinoma, have I seen myxœdema. In his operation for exophthalmic goitre, Kocher's latest statistics are: 95 per cent. of operative recoveries, with cure in 75 per cent., and improvement in the remaining 20 per cent.

Statistics as to the results of operation are very misleading, especially in Graves' disease, for there is a form of acquired or pseudo-Graves' disease, which Kocher calls *Struma Gravesiana Colloides*, where operation is quite safe, and these cases are often included in the brilliant results of the operative procedure for the cure of exophthalmic goitre. In this form the goitre has existed long before the nervous symptoms have developed; in fact, the symptoms of Graves' disease are, so to speak, grafted on the common form of colloid goitre. The symptoms are less severe than true Graves' disease, exophthalmos is often wanting, there is less dilatation of the heart, and altogether the disease is of a milder type. In such cases operation causes but little anxiety. I have operated on

many such and always with resulting cure. I have no doubt as the technique of operation for exophthalmic goitre becomes more perfected and our knowledge of the cases proper for operation improves, the immediate results of operation will be better.

One thing I should like to impress on the physicians, is that early cases are much safer to operate on than old ones, and the surgeon should not to be called in only to cases which are desperate and have yielded to no medical treatment, but he should see the cases as soon as diagnosed, and a consultation would then determine whether the case is one for surgical interference. Those cases in which medical treatment availeth not are not the best for surgical operation.

THE PSYCHO-NEUROSES IN ASYLUM PRACTICE.

BY

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The assumption that at least a considerable proportion of those to whom this paper is addressed have had no special training in psychiatry, and are, consequently unfamiliar with the terminology of that specialty, demands of the writer an effort to present his subject freed as far as is possible from the technicalities and abstrusities which abound in the literature on the psychoses and psycho-neuroses. The subject is so large as to preclude its full discussion in a paper of moderate length. It seems desirable, therefore, that my paper should be both elemental and general, that I should avoid debatable points, and should eliminate many references which might well be introduced for purposes of illustration or emphasis. Necessarily this implies an incomplete and fragmentary interpretation of the subject, especially as the writer, at no time facile in expression, finds unusual difficulty in presenting so technical a topic in a non-technical way.

Further embarrassment is experienced because of the impossibility of drawing a line between the neuroses which have a mental cause and the psychoses. Hysteria, doubtless the most clearly defined of the psycho-neuroses, has for many years been claimed both by the neurologists and the psychiatrists. Comparatively few of its victims require admission to an asylum, yet that this disease bears relation to definite insanity, now seemingly as a causal factor, now as an incidental feature colouring the clinical picture, now possibly as a sequential condition, is the testimony of many of the authorities on mental diseases; and doubtless everyone here to-day has more than once experienced difficulty in deciding whether

or no a patient with marked hysterical symptoms should be committed to an institution for the insane. So, too, the fears and scruples of psychasthenia grade in severity until a point is reached when it becomes most difficult to determine whether they should or should not be regarded as evidence of insanity. And, were it necessary, instances might be multiplied to set forth the impossibility of always differentiating between these inter-related rather than closely allied conditions.

The question of etiology remains one of the most difficult and indefinite with which the psychiatrist must deal. Should a body of psychiatrists be asked to name what they consider to be the causal factor of which we have most certain knowledge, a majority would unquestionably say alcohol. There seems to be an obvious connexion between alcoholism and insanity, yet of the method by which the drug produces the mental disorder, we have to confess much ignorance. Such being the case in so conspicuous an instance of seeming cause and effect, we may surely hesitate in dogmatizing an etiologic association between a neurosis characterized by a greater or less partition of consciousness and a state of mind in which consciousness may or may not be greatly disturbed. Analyses sufficiently minute to determine definite splitting of consciousness have not as yet been carried out in such numbers of insane patients as to warrant general conclusions being drawn, and it is consequently well to be chary meanwhile. But of this we may speak with some assurance—certain conditions which tend to the production of the psycho-neuroses play a causal role in the psychoses also, and it is safe to say that the predisposition to the psychoneuroses constitutes also a predisposition to insanity.

We have ceased to attach importance to fatigue of the nerve cells from excess of functional activity as a cause of mental breakdown. The total bulk of the cortical cells is so inconsiderable that any toxic material formed by them must be small in quantity and probably a negligible element. But we have ample evidence of the sensitiveness of the nerve cells to toxins elaborated by other organs, and that these toxins can be altered in amount and in virulence by varying emotional states has been demonstrated over and over again. In this way, emotional states, especially if of a depressive nature and when prolonged, are regarded as having a definite place in the etiology of insanity. It is also to emotional disturbances, though perhaps of a very special type and under special conditions, that the psychoneuroses are assigned. In at least this particular, then, they have common ground with the psychoses. When, therefore, we find undoubted insanity developing upon what appeared to be a psycho-neurosis, we may be justified in assuming the primary cause to be some unpleasant experience, productive of a disagreeable

effect, which was not properly reacted to. The fear of insanity with which many psycho-neurotics are haunted proves, in a certain proportion of cases, to be well grounded, and by no means few of those who do not possess this fear eventually become insane. Just what the relationship is can only be conjectured, but my impression is that the psychoneuroses do not often in themselves bear a causal relation to the psychoses, but are rather incidental to the development of such conditions—although they influence the clinical picture and may colour it largely. Usually, however, even in individuals who are predisposed hereditarily or otherwise, a number of causes doubtless co-operate to produce insanity, and if a psychoneurosis has developed purely as a result, say, of a repressed emotion, some additional factor must be necessary before such a condition will pass over into insanity.

It is scarcely necessary in this connexion to argue for or against Freud's contention that the unpleasant, unreacted-to experiences to which he attributes so great importance in causation, are of a sexual nature. It would appear admissible that unpleasant experiences of any kind may act as causes, and it is quite possible that the average individual is more frequently and sometimes more intensely exposed to disturbing influences of a non-sexual character than to those the importance of which Freud accentuates. Until we are able to properly apportion the influence of all the various possible causal factors, there appears to be no reason for assuming an insistent attitude in this particular.

The interest added to the study of the psycho-neuroses by the teaching of the Breuer-Freud school is largely responsible for the attention which has recently been directed to this group of disorders. It is quite too soon to attempt a valuation of this teaching, and, notwithstanding its attractiveness and suggestiveness, I am not sufficiently convinced, as yet, to commit myself definitely to its support. Nevertheless, it may reasonably be claimed that our present enlightenment is in some measure due to the investigations of Breuer and Freud and their followers, and, in the case of hysteria at least, we owe to this school a remarkable addition to our therapeutic armamentarium. By psycho-analysis we are not only able to discover the pathogenetic factor of the hysteria, but in exposing it we thereby effect a cure of the condition. In the case of the obsessions and anxious states, psycho-analysis is potent in revealing the genesis of the condition, although it does not yield the extraordinary therapeutic results which obtain in hysteria. In pronounced mental disease, psycho-analysis becomes progressively more difficult and unsatisfactory in proportion to the grade of mental defect, and it is quite too much to expect that its practice will ever become applicable to conditions in which there is considerable mental reduction. Nevertheless, the

illuminating work of Jung on the psychology of dementia præcox shows that we do not lack opportunity even here, and it affords us an instructive comparison between dementia præcox and hysteria. That the milder manic states are accessible to this method is proven by a recent article by Ernest Jones, and certain mild depressive cases, in which control over volition is retained, yield fair return for labour expended. In such conditions we must be content to lay bare the pathogenetic mechanism, and should not count upon direct therapeutic benefit. Anything which can assist in solving the difficult problems of cause and effect with which the psychiatrist is concerned is welcome, however, not merely because of the immediate satisfaction it affords us in clarifying our position, but also because of the promise of future advance in treatment. It is needless to state that the earlier in the course of the disorder the method of psycho-analysis is applied, the more complete will be the result. Here lies the opportunity of the general practitioner, to whom the psychotic patient appeals for treatment long before he falls into the hands of the psychiatrist. No greater problem presses for solution to-day, whether considered from the medical, sociologic, economic or purely humanitarian aspect, than the growing prevalence of insanity, and the physician in general practice is obligated both to his clientele and to the nation at large to prepare himself for his share of the task of uncovering the mysteries of mental derangement. The unusual interest which attaches to Freud's methods, the near relationship which is now seen to exist between conditions formerly thought to belong to the realm of the neurologist and those which have always been conceded to the psychiatrist, and the outstanding importance of sound-mindedness to the community, form a leash of reasons which should attract every practitioner to a study of this great subject.

Whether wittingly or no, we have all been practitioners of psychotherapy to a greater or less extent. All admit the influence of suggestion, whether intentional or purely accidental, in determining the outcome of an illness. We have all witnessed good results, and doubtless we have all witnessed most unfortunate results, following upon some impression we have made upon our patients. Psychotherapy, however, embraces more than suggestion, and its successful application requires much more than mere capacity to impress a patient with one's knowledge and skill. We are gradually accumulating information which promises to enable us to make use of psychic treatment in a thoroughly rational manner, instead of in the empiric fashion which has obtained heretofore. Already we find isolated cases in which we can prescribe it with almost mathematical nicety, and almost with certainty of the result. But there are instances in which we can control the attention

of the patient, and in which there is no notable intellectual or volitional defect. It is very doubtful if there will be material enlargement of our resources in this particular in the treatment of the insane. Yet the success which attends the application of the advanced psychotherapeutic methods in the treatment of related conditions should stimulate us to more diligent use of the psychic practices which have been found of value ever since the days of Hippocrates. Rational conversation, persuasion, judicious argument, appeal to reason, stimulation of hope and of confidence—these are measures which are more or less applicable to and more or less efficacious in all cases. In the milder types, the newer methods should be given a fair trial in order that a just estimate of their value may be formed. But for the present, at least, such measures should be adjunctive to the regular therapeutic procedures.

It is particularly in prophylaxis that we may expect the greatest results to psychiatry from the newer methods. The applicability of these methods to the neuroses or psychoneuroses which tend to pass over into insanity should be fully appreciated, and there can be little doubt but that their intelligent and careful adaptation to such cases will prove an appreciable factor in the prevention of mental disease and thus in lessening the prevalence of this dread condition. I feel that this is the point in my paper which should be especially urged. The experience of many institutions for the insane is that, despite our increasing knowledge, the cure-rate in insanity is not showing improvement. The proportion of cases of dementia præcox and of general paralysis finding their way to our institutions is steadily growing. These conditions, once established, offer small prospect of cure, and thus we have reason for the failure of hospital statistics to show betterment. We cannot yet say what prophylaxis will do towards the relief of this unfortunate state of affairs, but it appears highly desirable that no method by which mental breakdown may be obviated should be neglected. Here again the appeal is to the general practitioner, who alone meets cases at a time when prophylaxis is possible.

A CONTRIBUTION TO THE STUDY OF ACUTE POLIOMYELITIS BASED ON THE OBSERVATION OF THIRTY-EIGHT RECENT CASES WITH TWO AUTOPSIES.*

BY

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While we recognise that it will be impossible to add to the description of acute poliomyelitis in its epidemic form as given by Wickman,¹ in 1905, and Harbitz, and Scheel,² in 1907, of the great epidemics in Nor-

*Read before the Canadian Medical Association June 1st to 4th, 1910.

way and Sweden which occurred in the years between 1903 and 1906, it may be of interest to compare the disease as it appeared in Montreal in the epidemic of the summer and autumn of 1909.

Wickman and his colleagues worked out the details of four epidemics, one of them consisting of over a thousand cases with a mortality of 13.1 per cent. Within the last three years severe epidemics have occurred in New York, in 1907,³ consisting of about 2,500 cases, and again in the summer of 1908,⁴ when about 1,200 cases developed. In Victoria, Australia, in the autumn months of 1907, Dr. Stevens⁵ analysed 135 recent cases. In Massachusetts, during the summer of 1908, Lovett⁶ and Emerson⁷ gathered together 234 cases, in Salem, Virginia, Wiley⁸ and Dardem reported 25 cases of an epidemic which occurred the same summer.

Vienna and lower Austria suffered from a similar epidemic in 1908, when Zappert⁹ found data from 266 cases available. Epidemics of moderate severity have been reported as having occurred this past summer in Marburg¹⁰ and also in Westphalia¹¹. It is interesting to notice also that there has been an unusual frequency of poliomyelitis reported in France¹² during the past summer.

I may say that I have been led to the same conclusion as these authors as regards terminology. Acute *anterior* poliomyelitis is a misnomer as the disease is far more widespread than this term implies; it is really an acute meningo-poliomyelitis and may be encephalitis.

It is impossible in the absence of Government recognition, where the notification of the cases as they occur is not compulsory, to speak of the epidemic as a whole. It is even more impossible to form an idea on the causation of such an epidemic without a systematic examination into the surroundings of every case. That the expense to the Government of such a systematic study would be justifiable one can judge from the following report, including as it does only cases which have come under my own personal observation in the neurological department of the Royal Victoria Hospital and in my private practice, between July 1st and December 31, 1909.

I have seen in all thirty-eight cases, twenty-six of which occurred within the city limits, three other cases occurred on the Island, two at Ahuntsic, and one at Highlands, one came from the Laurentian Mountains, one from St. Hubert, Chambly Co., one from Ottawa, one from Brownsburg, P.Q., one from Stanbridge East, one from East Hatley, and one from Halifax. It must be remembered that this does not include those patients who were treated at the Montreal General or the Western, the Hotel Dieu or the Notre Dame Hospitals, or who were treated by

their own physicians. In reply to a circular sent to the Montreal physicians I have notes of many of these, and I hope at a later date, in conjunction with my colleague Dr. Shirres, to be able to give a fuller although still necessarily an incomplete account, of the number of cases that occurred in the city during the summer. I may say, for the purposes of comparison, that previous to July, 1909, we have only had two sporadic cases treated in the Hospital or the Out Door Clinic since 1906.

The age of the patients varied from three months to forty-two years; 60 per cent., however, were only three years old or younger. Tabulated they are as follows:—

25 were between the ages of	.....	1 and 5
8 " " "	.....	6 " 10
1 case was " "	.....	11 " 15
1 " " "	.....	21 " 25
2 were " "	.....	36 " 40
1 was " "	.....	40 " 45

The distribution according to sex was practically equal, there being 18 females and 20 males affected. The nationality of the individual apparently played no part, there being 50 per cent. English speaking, and 31.64 per cent. French speaking patients among those affected; 12.82 per cent. were Hebrews, while Italians and Russians each contributed 2.63 per cent of the total number. This is, I think, approximately about the proportion of the different nationalities seen at the clinic.

The greater number of cases occurred in August and September. Classified according to the month in which they occurred they are as follows:—

July	.....	4	September	.....	13
August	.....	12	October	.....	9

There is no doubt that the disease is an infection, but the infectibility must be very slight, as in nearly every case there were one or more other children in the same house, and in no case of this series was more than one affected. We all know, of course, that cases have occurred where several members of a household have been affected, and cases are reported where the infection has apparently been carried by a third person who has himself not suffered from the disease, but these cases are relatively seldom. In two cases there has been rather a strange coincidence. In one, the child about two years old, developed a paralysis of the left deltoid muscle; the father has a precisely similar paralysis of the same muscle which he developed in infancy. In the second case, also a child with paralysis of the deltoid, a brother had a similar localized paralysis which had developed one year previously. Practically

all the cases in the city have developed in the overcrowded districts to the east and south where cleanliness is uncommon, although a few have come from amidst apparently clean surroundings.

In the majority of cases the disease was preceded by certain prodromal symptoms which lasted on an average a little over two days before the onset of the paralysis. It is true that, in five cases, the paralysis developed suddenly while the child was playing and apparently in its usual good health. In others the prodromata were present for six or twelve hours before the onset of the paralysis; in others, again, it was as long as five to seven days after the onset of the prodromal symptoms that the paralysis of the limbs appeared.

As a general rule the patient complains of a little indefinite general malaise, has some headache, and may vomit once or twice. The bowels are usually constipated, but in a few cases there has been diarrhoea. Some indefinite gastro-intestinal disturbance so common in children is suggested, especially as the fever is only slight as a rule; but if the child be old enough to make a complaint, or if in younger ones the limbs be moved, there is immediately evidence of pain and tenderness in one or other or perhaps all the extremities, which should suggest something more than the ordinary gastro-intestinal condition of infancy. In about 30 per cent. of the cases there has been a history of more or less marked clinical signs of meningitis; in only three cases were there convulsions.

Ever since the time of Mephibosheth, the son of Jonathan, of whom it is reported that at the age of five years his nurse let him fall from her arms, and from that time he was not able to walk, we have frequently the history of a preceding accident to which the patients attribute the onset of the paralysis. A similar history has been given in a few of our cases, but in none did it seem possible to connect it as the causative factor. In two the fall was of such a slight nature that it seemed far more likely to be the result rather than the cause of the paralysis. As a rule, the paralysis at its onset is at its height, but in some cases there has been a spread of the disease quite similar to what one sees in the so-called Landry's paralysis. Both of the cases, whose clinical histories with autopsy findings will be reported later, are examples of this. In both cases the cause of death was due to final involvement of the respiratory centres.

The *spinal form* of the disease was by far the most common. At the onset at the height of the paralysis, all extremities were powerless in nine cases; both legs were affected in twelve; both arms alone in only one; one leg was alone affected in four; and one arm alone in six.

Both legs and one arm were picked out in one case, and one leg and one arm in two cases, in one of which they were on opposite sides of the body.

The *pons and medulla* were affected in three cases, the face alone being paralysed in two cases; in the third not only was the left side of the face paralysed, but there was oculo-motor and motor paralysis of the fifth nerve, with the consequent strabismus and ptosis, and inability to close the jaws; the patient, a child of two and-a-half years, could not protrude the tongue. This was later associated with a spastic paralysis of the right arm and leg, showing a spread of the lesion and the involvement of the upper motor neurones to the limbs of the opposite side of the body. This child eventually made a good recovery.

In three cases, while one could hardly call them *abortive*, still the lesion was evidently of a less serious nature, as the muscles never lost their reaction to the Faradic current, and there was a perfect return of function in the course of six weeks. One of these cases was a man of 42, in whom both legs were completely paralysed; another was in a man of 37, in whom the anterior tibial groups of muscles were picked out, and the third was a girl of nine, in whom the left side of the face and some of the ocular muscles were paralysed.

There was retention of urine for from one to two days in only three cases. In the majority of cases there was a marked and rapid improvement in the extent of the paralysis in the first ten days. In one case, for example, where all extremities were paralysed for a week, the right arm was the only one which remained paralysed, and in another similar case the right leg alone remained affected. In three cases where the whole arm had been affected the deltoid was the only muscle that did not regain its function. The muscles of the hands and feet were not in any case completely and permanently paralysed.

The tenderness on movement of the affected limb was severe in every case, and remained present for several weeks in many; in one case, indeed, the spontaneous pain and later the excessive tenderness with rapid atrophy of the muscles suggested an associated *neuritis*. There was definite impairment of sensibility observed in a few cases.

After the first two weeks the improvement is very much slower and dependent to much greater extent on the care and treatment received; contractures are apt to occur in muscles retaining some power where they are unopposed, their antagonists being paralysed at least temporarily. This, if left alone, goes on rapidly to deformity and prevents the return of function in the paralysed group even if the nerve centres do recover. On the whole it has been a pleasant surprise to me and my colleagues

in the Neurological Clinic, judging from the prognosis given in the usual text books, to see how much recovery has taken place in the course of two or three months' treatment in cases where the electrical reactions gave anything but a good prognosis.

The following is the clinical history and the autopsy findings in two cases:—

*Case I.**—The following is from Dr. McCrae's notes—E., aged 24 single, engineer; admitted complaining of weakness, loss of appetite, pain in the right hip, and inability to use the hands; seven days previously he had developed a sore throat but worked till the second day before admission. On this day he went to bed. For these seven days he complained of headache, at first frontal and occipital, and finally the pain was in the neck. The day before admission he vomited thrice, was constipated, and reported difficulty in thinking, and on the day of admission had dyspnoea on lying down. His previous history is uneventful, save for a severe attack of neurasthenia at the age of 16, for which he had several months' treatment.

On admission to the Royal Victoria Hospital at noon, his temperature was 99, his pulse 76. He could not hold a cup in his hand. His breathing was jerky and abdominal; his pupils reacted to light and accommodation; there was no nystagmus, the fields of vision were normal. The throat was clear, some pain was complained of in throwing the head forward. Dermatographia was marked; there was no tenderness of the spine or hips; the abdominal reflexes were equal and active.

The grip of the hands was weak and they were held semi-flexed; the wrist and elbow reflexes were not obtained, knee jerks were lessened, Kernig's sign was 135° on both sides, ankle jerks not obtained, no Babinski's phenomenon. All movements of the legs were normal except raising the extended limb, which was done weakly and with tremor. Sensation to rough tests was normal. About 3 p.m. the temperature was 99, the pulse 76; the dyspnoea had increased, the accessory muscles of respiration being used.

At 7 p.m., when he was seen by the writer in consultation, the condition was as described above. The respirations were about 65 and abdominal in type, the temperature 99, the pulse 56. In spite of the extreme dyspnoea the accessory muscles of respiration were not in action, at the same time the patient could use the sterno-mastoids to some extent voluntarily in turning the head on the pillow.

The left knee jerk was obtained but weakly. The muscles all contracted well to mechanical stimulation, for instance, when struck with

* These two cases have already been published in a less detailed preliminary report, *Montreal Medical Journal*, December, 1909.

a percussion hammer, and showed a condition of myoedema; that is, when they were struck or pinched, a slow localized contraction of the muscle took place, giving rise to a small ridge which disappeared again in 20 to 30 seconds. The muscles all reacted well to Faradism. At midnight the patient's temperature rose to $100\frac{3}{4}$ and the pulse was 76. Cerebration was apparently quite clear. He died suddenly at 3 a.m. of respiratory failure. At autopsy, which was performed 8 hours after death, the following conditions were noted:

The skull was of moderate thickness. The dura was firmly adherent to the vertex, the sinuses free. The pia over the vertex was cloudy with one small, quite thickened and white area on the left hemisphere about the middle, close to the longitudinal sinus and in the immediate anterior extremity of the right frontal lobe was another; each measured about 5 mm. in diameter. The superficial vessels of the vertex were slightly congested. The pia over the base appeared normal, but there was more marked congestion of the vessels over the brain stem. There was no thickening of the pia on the superior surface of the cerebellum. The brain weighed 1,525 gms.

Cord: The spinal dura appeared normal. On palpation the cord at the lumbar enlargement was hard and felt like a lead pencil. In the dorsal region this was not so noticeable; but in the upper part of the cervical region it could be felt through the dura. On opening the dura there was no particular congestion of the vessels of the anterior surface of the cord, while those of the posterior surface were slightly so, especially in the lumbar region and over the cervical enlargement. On the posterior surface there were numerous irregular shaped, hard, pearly white, plaques of cartilaginous hardness. There was a slight tendency, especially in the lower dorsal and lumbar regions, to a wrinkled appearance in a transverse direction, as if a fine thread had been wound tightly and irregularly around the cord; this was thought to be due to the œdema of the cord. On section in the lumbar region there was a moderate amount of eversion of the edges of the cord, and there was apparent to the naked eye a softening of the anterior horn on the left side. In the dorsal region this eversion of the edges, on section, was even more marked and the grey matter was softened and indistinctly demarcated. There was a visible congestion of the vessels of the grey matter of the cord in this region.

The spleen was enlarged and the lymphoid tissue strikingly prominent. There was also acute hæmorrhagic nephritis.

Microscopical examination gives the following findings:

1st. *Sacral Segment.* The meninges show a marked round-celled in-

filtration chiefly in the neighbourhood of the anterior spinal artery and penetrating into the anterior fissure along with the vessel; but it is present also on the posterior aspect of the cord. The spinal vessels are markedly congested, and there is an excessive perivascular lymphocytic exudation. There is no evidence of thrombosis in any of the vessels. In the substance of the cord the vessels are dilated and congested generally, not only in the region of the grey matter but in the lateral and posterior columns as well. They are in every case surrounded by numerous round cells, mostly lymphocytes; and there are also a great many plasma cells amongst these. A few ganglion cells still exist with a fairly normal outline especially in the lateral nuclei. Apart from these there may be seen cells in various stages of destruction, some large and swollen, staining poorly with the nucleus almost extruded, others small and shrunken staining deeply, with no nucleus visible, others again scarcely visible on account of the numerous small round cells that encompass them, evidently the final stage in their disappearance.

2nd. Lumbar Segment: The same infiltration of the meninges is present as in the former section, especially evident around the vessels. There is very marked generalised congestion of all the vessels in the cord substance with perivascular exudation. This is more evident in the anterior horns on account of the better vascular supply, but the individual vessels of the posterior columns of the cord show an exactly similar condition. There has been a rupture of a small vessel in the right anterior horn with a small hæmorrhagic extravasation. Throughout the section there is the same round celled infiltration, chiefly lymphocytes, with polymorpho-nuclears, and a good many large plasma cells. This infiltration is most marked in the grey matter of both the anterior and posterior horns and the white matter immediately surrounding this. The ground substance of the cord has a rarified appearance with dilated meshes due to the odema present. No nerve cells can be discovered, only occasional clumps of white cells show the last stages in their disappearance.

9th Dorsal Segment: The same infiltration of the meninges is present although perhaps less marked than in the lumbo-sacral region. The cord substance has the same oedematous appearance and shows the same general leucocytic infiltration of the grey matter of the anterior and posterior horns and the white matter immediately surrounding, although this also is not so marked as in the previous sections. The same extensive perivascular exudation is present. Not a nerve cell can be found at this level of the cord save three in Clark's column on the right side. and as there are no collections of leucocytes, as in the former sections

marking the final demolition of the cells, this has evidently already taken place.

6th Dorsal Segment: Is practically the same as the former section.

8th Cervical Segment: At this level there is the same evidence of meningitis as in the other sections, and here, also, the nerve roots do not appear to be involved. There is the same intense congestion of all the vessels in every part of the cord with the perivascular exudation. There is the same general infiltration of round cells in the grey matter of both the anterior and posterior horns and the surrounding white matter, and the utter absence of any nerve cells.

4th Cervical Segment: Shows the same picture.

Lower Medulla: Here we see the same evidence of meningitis, but it is even more intense than in the lower levels of the cord, the same general congestion and perivascular exudation of lymphocytes and numerous plasma cells. There is also a fairly well marked general round-celled infiltration of the gray matter, but there are numerous nerve cells still remaining in a good state of repair, here and there one sees in the gray matter clumps of leucocytes which probably represent the final stage in the destruction of some cell, but as a general thing the nerve cells appear normal.

Medulla at the level of the 9th Nucleus: The infiltration of the meninges is less marked than lower down, though it is present to a slight extent. One sees the same congestion of the vessels and the perivascular exudation of leucocytes, which is most marked in the formatio reticularis. There is also a certain amount of round-celled infiltration in the reticular portion though the nerve cells do not appear to be affected.

Pons, Level of the 4th Nucleus: The vessels of the formatio reticularis are here also congested and surrounded by numerous leucocytes. The nerve cells of the nucleus stain well and appear normal.

At the level of the 3rd nucleus the same thing is visible.

Sections of the optic thalamus and of the left centrum ovale show nothing abnormal.

Sections of the left frontal cortex show slight infiltration of the meninges beyond which there is nothing abnormal.

The bacteriological examination for which I am indebted to Drs. Tytler and Klotz is as follows:

At autopsy cultures were made from (1) the heart's blood, (2) pericardial fluid, (3) liver juice, (4) spleen juice and (5) cerebrospinal fluid.

At the same time smears were made from the various fluids collected and were examined in stained specimens. Organisms were found in

the heart's blood, pericardial fluid and cerebrospinal fluid. The organisms from the different regions were alike morphologically, but were most abundant in the cerebrospinal fluid. These organisms appeared as cocci, occurring in pairs and occasionally in tetrads. A few were flattened but most of the organisms were spherical. The majority of the organisms were decolorized by Gram's method, but some resisted decolorization after the nuclei of the leucocytes were decolorized. The cerebrospinal fluid was distinctly cloudy and showed a large excess of leucocytes.

Cultural: Organisms were found in the cultures taken from (1) the heart's blood, (2) pericardial fluid, (3) liver juice and (4) cerebrospinal fluid. No growth was obtained on any of the media on the first day. On the second day a growth appeared in plain serum water in all inoculations save those of the spleen juice.

Organisms could also be found on blood serum and blood agar media although there was no macroscopic evidence of growth. Organisms were also found in the sediment of the dextrose broth tubes. Transfers made from the inoculated media to new tubes proved unsuccessful, save where serum water was used. In this latter medium three generations of the organism were obtained, but at the end of a week no further transfers grew on freshly inoculated media.

The organisms which were obtained in the cultures were morphologically similar to those noted in the direct smears. Most commonly the cocci were seen in pairs and not infrequently the individuals were much flattened towards each other. Here and there tetrads were noted. As a rule the organisms were larger than those seen in the direct smears.

The organisms stained well with the ordinary stains and with Gram's method were decolorized with some difficulty. It was found that after decolorizing five minutes some of the organisms still remained positive, while many had given up the stain.

Case II.—G. E., a well developed boy of 10 years, had been spending the summer with his parents among the Laurentian lakes, and previous to the onset of the present illness had enjoyed perfect health. Early on the morning of August 5th, he complained of headache, and his mother noticed that his breathing was more rapid than usual. He had spent some time the previous day, which had been very hot, swimming, and then lying out on the roof of the cottage in the sun where there was a little breeze. Just before sunset he and some friends paddled some considerable distance down the lake, but on the way back after sunset he did not paddle but lay in the bottom of the boat. He was scantily clad in the light clothes he had worn during the heat of the

day, and on being asked said that his feet were cold. The pain in his head and the back of the neck continued during the day of August 5th. His temperature was 100° F., and he would take no nourishment. The following day he had developed a flaccid paralysis of the lower extremities with loss of reflexes; the arms, later in the day also became paralysed, especially the left. Beyond the pain in the head and neck he did not suffer and his mind was clear, respirations still very rapid, but the temperature had fallen to normal and he took some light nourishment. The next day there appeared to be some improvement in the arms but otherwise no change from this on, except that the respirations became more and more difficult. When he was seen by Dr. Fraser Gurd for the first time on the fifth day of the disease there was paralysis of the intercostals and the diaphragm; life was dependent on the extraordinary muscles of respiration only, and, as was expected, the patient died that night of respiratory failure.

The autopsy was performed at the home of the parents 10 hours after death. The brain and cord were removed, the other viscera could only be examined *in situ*, and showed no abnormality. There was nothing to be noted about the calvarium, the dura was of normal colour and glistening; there was no congestion either over the cord or brain.

On removal the brain looked large for the size of the head, and it weighed 1,550 gms. The superficial vessels were not particularly engorged, but the surface of the brain had a peculiar slightly bluish gray colour; on section the edges evert showing the capillaries of the cortex somewhat engorged in places.

Cord: The dura was covered posteriorly with a thick layer of fat, The dura itself was healthy and glistening. On palpation through the dura the cord felt extremely hard, especially over the lumbar and dorsal regions. On opening the dura the vessels of the pia-arachnoid were slightly congested. The whole cord from the lower end of the cervical enlargement to the sacral segments has the appearance of having been wound carelessly but tightly with fine thread showing everywhere little irregular ridges and bulges, evidently the swollen cord structure bulging through the strands of the pial tissue. There was some slight cloudiness of the pia-arachnoid over the posterior surface. On section, the edges evert to a marked degree, and the anterior horn region looks softened, swollen, and almost diffuent; that is, in the lumbar, dorsal, and to a less degree in the lower cervical region.

Second Sacral Segment: Microscopically, there is infiltration of the meninges with round cells equally well marked all round the cord.

This infiltration does not affect the nerve roots. The superficial vessels are congested and surrounded by lymphocytic exudation; those of the cord substance are similarly congested and show the same surrounding round-celled exudation. The infiltration of the grey matter is also present, but not to such a marked extent as in the previous case. Many of the nerve cells have disappeared, but a few still remain and retain their normal appearance. The congestion and the surrounding exudation is quite general affecting these vessels coming in from the periphery of the cord as well as the branches of the anterior spinal artery.

Fourth Lumbar Segment: The same picture here, slight meningitis, marked congestion of the vessels of the substance of the cord with an occasional small rupture and hæmorrhagic extravasation. The same perivascular exudation of lymphocytes and round-celled infiltration of the grey matter. The ganglion cells have entirely disappeared.

Ninth Dorsal Segment: An identical appearance to those already described. Only a few nerve cells in Clark's column on the left side remain.

Eight Cervical Segment: The infiltration of the membranes is less marked than in previous sections. It is present to the greatest extent in the anterior fissures and follows the course of the vessel into the left anterior horn; the vessel is congested but shows no evidence of thrombosis. The congestion of the vessels in the substance of the cord is general, but the perivascular round-celled infiltration is by no means so marked as in the previous case, nor is the infiltration of the grey matter nearly so extreme. None of the ganglion cells are recognizable.

Fifth Cervical Segment: Presents an almost identical picture to that just described, save that there are one or two ganglion cells still recognizable in either horn.

Second Cervical Segment: Presents a similar appearance, save that the round-celled infiltration is again more marked, especially around the vessels, but also in the grey matter.

Lower Medulla: The meningeal infiltration is here present; and there is marked generalized perivascular lymphocytic exudation. The nerve cells, however, appear quite normal.

Right Post-Central Convolution: Shows marked congestion of the vessels of the meninges with surrounding exudation of the lymphocytes; the meninges show a slight degree of infiltration; the cortex appears quite normal.

Right Olfactory Lobe: Shows nothing abnormal, although the vessels of the meninges are congested and show the usual lymphocytic exudation. The posterior ganglia were, unfortunately, not examined in either case.

The pathological picture in the two cases was then very similar, the

second showing simply a more advanced stage of what was seen in the first. There is the same evidence of inflammation affecting both the cerebral and spinal leptomeninges, the same congestion of the vessels both on the surface and in the substance of the brain and cord, especially marked in the latter. There is the same lymphocytic infiltration of the grey substance both of the anterior and the posterior horns of the cord, but this is more marked in the first case where the surrounding white substance of the cord is also affected. In the first case, also, plasma cells are more numerous in the infiltrated parts, and the clumps of leucocytes surrounding the remains of ganglion cells can still be seen, notably in the sacral region, evidently acting as phagocytes demolishing the destroyed cells. The second case shows the process in a slightly later stage, the phagocytic work has been accomplished; the inflammation is beginning to subside again. In both cases the inflammation and oedema of the cord substance is perhaps most marked in the dorsal region; but the cervical and lumbar enlargements are about equally severely affected.

The medulla and pons show the same evidences of meningitis, generalized congestion and round-celled infiltration, especially in the formatio reticularis. In neither case could I find organisms in the tissues. The micro-organisms found in the first case correspond very closely with those described by Gierswold in the Scandinavian epidemic, and since described as present in many cases in almost every epidemic reported. In no case could they be satisfactorily cultivated.

The disease, then, appears to be a general vascular infection, but regarding the ætiology of the disease and the mode in which the infecting agent makes its entry into the body, we still remain in doubt. However, a great advance has been made in the last few months. First, Landsteiner and Popper,¹³ and later, Flexner and Lewis,¹⁴ have been able to inoculate monkeys with the disease. The latter workers in a most brilliant series of experiments have succeeded in transmitting the disease through a series of monkeys from one to the other. Their work is already too well known to require more than a reference to it. However, they have shown that the ætiological factor is not a soluble toxine, and are of the opinion that it must be some minute organism too small to be seen by the microscope, similar in many respects to the unknown organism of rabies.

They have been able to cultivate this organism, and have caused the disease in monkeys by inoculating this culture. They have shown that the virus will penetrate a Berkefeld filter. They have demonstrated that it retains its virulence after having been frozen for a very con-

siderable time. In view of this last point, it is difficult to understand why the disease should be stamped out in the winter months; unless, perhaps, the carrier of the disease germ is not operative. In any case, continued work should soon show us how to fight this dread disease, in the prevention of which, at present, we are absolutely powerless.

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COLOURED TORIC GLASS FOR USE IN EXAMINING CASES OF OCULAR PARALYSIS.

BY

W. GORDON M. BYERS, M.D., Montreal.

While small appliances like that which I have to describe are in themselves unimportant, their widespread use, and their use for a long period, mean in the aggregate a great saving of time; and anything that helps to smooth the difficulties of medical practice is undoubtedly worth while.

In making a differential diagnosis of ocular paralyses, it is customary to place a red glass before one of the patient's eyes, first, to enable him to more easily locate the two objects, and, secondly, to overcome any tendency to binocular vision that may remain. But the use of the coloured glass, as ordinarily taken from the test case, is often the cause of slight but real annoyance. In the lateral ocular movements the vision of the eye before which the glass is placed first strikes the rim of the lens and then passes beyond it, out of the colour field. This confuses the patient, and makes it difficult both for him and the examiner to accurately place the images.

About four years ago I tried to remedy this defect by making a glass double the size of that which is found in the test case; but this only partially overcame the difficulty which I wish to correct. With the

introduction of toric lenses, it struck me that a coloured glass of this sort might be of service in making examinations easier in the class of cases I have mentioned. The little apparatus was procured for me by Mr. R. N. Taylor, of Montreal, from a large company in England, as the leading optical concerns in the United States were unable to make it. It is simply a large, perfectly-ground toric lens, of a rich red colour, properly rimmed, and supplied with a convenient handle; but the wider colour field which the curved glass affords does away almost entirely with the difficulties previously experienced in examining cases of ocular paralysis.

AMBLYOPIA EX ANOPSIA WITH ACQUISITION OF GOOD VISION

BY

GEO. H. MATHEWSON, M.D., Montreal.

There has been much controversy as to whether such a condition as amblyopia *ex* anopsia—that is, blindness, or very poor vision, from non-use or lack of education of the eye really occurs. The following case, which is unique in my experience, gives conclusive proof that we really do meet with eyes which do not see because they have not been trained to do so.

On May 27th, 1908, W.G., a boy of 13 years of age, was brought to me with a badly damaged eye. The history given by the boy and his mother was that while playing with some companions on the previous day he had been struck a violent blow on the left eye by a large stone thrown by one of the other boys. Both the boy and his mother stated also that he had never had good sight in his right eye. On examination I found that the left eyeball was ruptured and disorganized with absolutely no vision.

On June 2nd, I enucleated the left eye, and after an uneventful convalescence the boy left the hospital a week later. At this time the vision of the right eye was found to be no more than ability to count fingers at 12 feet, and with the addition of a + 4 spherical glass, it was improved to 6/36. He was unable to read even very coarse print with the glass. I examined his eye under homatropin and found his refraction about the same as without the mydriatic, so prescribed the + 4 spherical glass, telling his mother that his vision might improve. Five weeks later she brought him back, and I was surprised to find that his vision was 6/12 without the glass, while with the glass he could see 6/9, and could read the finest print with ease.

THE
Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

EDITED BY

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AN IMPERTINENT REQUEST.

We have received a communication from the Superintendent of Immigration informing us that much unfavourable comment has appeared in English papers upon the present rules which apply to immigrants entering Canada.

The comment, we are informed, applies chiefly to two regulations; the first, requiring immigrants coming to employment other than farm work, or, in the case of females, to domestic service, to have in their possession at time of landing the sum of twenty-five dollars, in addition to railway transportation to ultimate destination; the second, providing that the consent to emigrate to Canada, required by law to be granted by the Assistant Superintendent of Emigration for Canada in London, to such charity aided emigrants as he considers suited to this country, shall be given only to such as are suited for, willing to accept, and have assured employment at farm work.

We are asked to offer an opinion upon these regulations, so that it may be placed before the reading public of the British Islands, or "Isles," as the dominions of England, Scotland, and Ireland are described. We fail to see the necessity for this additional light, as we are told somewhat gratuitously, that "practically every Canadian paper irrespective of political connexion, which has so far dealt with the subject, has upheld the regulations, and insisted upon Canada being the sole judge as to who shall or shall not be allowed to enter this country."

We shall set aside at once the truculent suggestion, that any serious person has denied that Canada is "the sole judge as to who shall or shall not be allowed to enter this country;" and we shall content ourselves by making the equally obvious statement, that the Immigration authorities and the Labour Unions do not constitute the people of Canada by any large majority.

The movement to keep British artisans out of Canada is instigated by those who desire to see labour scarce, wages high, and the product of craftsmanship dear, and we fail to see why farmers are not equally entitled to demand the exclusion of farm labour so that food will cost even more than it actually does at the present moment.

If the regulations were designed to keep out of this country only the diseased, the vicious, and those who are likely to become a charge upon the community, it would be difficult to controvert them with any chance of being understood; though it could be urged with perfect truthfulness that not all of us are utterly callous to the situation of our more miserable brethren in the Old Country who have done so much for us in laying the foundations of Canada and in protecting us all these years, whilst we have been growing big, and sleek, and fat. We cannot refrain from adding that, if this regulation compelling immigrants to be in possession of five pounds had always been in force, many of those now in Canada would not be here or anywhere else.

In this attempt to manufacture expression which it is proposed to place before the reading public of England as "the consensus of Canadian opinion," we hope the Immigration authorities will not omit to include this opinion which is expressed by the MONTREAL MEDICAL JOURNAL, even if they are disappointed in our response to their lead, or do not like this dance to their piping. If they do forget, we shall take the proper steps to remedy the omission.

DR. WILLIAM GARDNER'S RETIREMENT.

The announcement which was made by the Dean at the Convocation for conferring degrees in the Faculty of Medicine, that Dr. William Gardner had signified his intention of retiring from the chair of Gynecology in McGill University, came with surprise to those who heard it for the first time. Dr. Gardner's intellectual and bodily vigour are so remarkable that it seemed that he was about to retire at the height of his career. Dr. Shepherd, however, reminded the members of Convocation that Dr. Gardner had occupied the chair for 27 years: and that he had occupied the chair of Medical Jurisprudence for eight years before that. Accordingly, he has served the University as professor for the long period of thirty-five years.

There is no use disguising the fact that Dr. Gardner's retirement is a serious loss to the Faculty and to the teaching of medicine, even though he has gathered about him a staff from which a competent successor can be selected. The fruit of his long experience will not entirely remain, though he has been sedulous all these years to bestow it upon his colleagues and upon his students. His passionless wisdom, his conscientious devotion to his task, his sure judgment in diagnosis, his sane decision upon questions of procedure, his humanity towards his patients both private and public, his rectitude of demeanour towards his colleagues, and the admiration and affection which he inspired in his friends—all this will find a safe abiding place in the high tradition of McGill University.

Dr. Gardner will be appointed Professor Emeritus, and with an increased leisure he will be more free to cultivate those exquisite tastes in art and literature with which his mind has always been graced. We may also hope that his services to this JOURNAL, of whose editorial board he is one of the oldest and most valued members, will be given as ungrudgingly for a long future as they have been given in a long past.

THE CANADIAN MEDICAL ASSOCIATION.

The forty-third annual meeting of the Canadian Medical Association was held in Toronto, June 1st, 2nd, 3rd and 4th. The sessions were held in the Convocation Hall of the University, Toronto. The meeting-place was so commodious that it was easy to make arrangements for the convenient assemblage of the various sections in close proximity to each other.

The comfort which the members enjoyed in attending the various addresses, demonstrations, and symposia, the ease with which they discovered friends from distant places, and transacted their various professional and social engagements will make it extremely difficult in future to recognize the claims of small cities which desire to have the meetings held within their borders. The next meeting will be held in Montreal, where the accommodation which the new medical buildings of McGill University offers will still further accentuate the advantage which is possessed by the larger centres.

The attendance was large; 432 members were present, and they came from places so far apart as Prince Edward Island and British Columbia. Montreal was especially well represented, and demonstrated once more its fidelity to the Association.

If Canada is ever to take its proper place in the world, each Pro-

vince must sink its individual interest into proper relation with the interests of the whole. To that end these meetings are a great aid.

The President, Dr. Adam Wright, worked unsparingly for over a year. By the cords of affection he drew men to him, and contrived a meeting which for unanimity of opinion upon all matters pertaining to the good of the profession, and for friendliness of feeling between the members, has not been excelled in the long course of forty-three years. He had a loyal support from his colleagues in Toronto, both from those who are within the University and from those who are without.

A peculiarly pleasant feature of the meeting was the presence of past presidents and older members. Dr. Blanchard, from Winnipeg; Dr. Stewart, from Halifax; Dr. Macneil, from Summerside; Dr. Atherton, from Fredericton; Dr. Murray MacLaren, from St. John. Dr. Tunstall, from Victoria; Dr. Roddick, Dr. Bell, and Dr. Armstrong, from Montreal, demonstrated by their presence alone how deep and wide laid are the foundations of the Association.

The two Universities, Toronto and McGill, were represented by their Deans, Dr. Clarke and Dr. Shepherd; and the President of Toronto was there to give a formal welcome to the members. Dr. Reeve and Mr. Cameron, by public speech and private hospitality, showed that their interest in the Association is as vigorous as ever.

The success of the meeting was a tribute also to the capacity of Dr. George Elliott, who for so many years has served the Association at the cost of—no one knows but himself—how much labour. Dr. Elliott retired from the office of secretary, and his name will be held in remembrance so long as the Association endures.

Above all, we should mention with high commendation the closeness with which the programme as publicly announced was adhered to. At too many meetings readers are conspicuous by their absence, some unavoidably, but others, we fear, who allowed their names to be placed upon the list without the resolution to be present, at no matter what inconvenience to themselves.

At the morning session of June 1st, in the Section of Medicine, according to the official minutes which were furnished to us, only one reader was absent and two papers were "read by title." In the Section of Surgery one paper out of six was unread. On Wednesday morning, in Obstetrics, one member was absent, and of only one other paper is no mention made. The showing in Pathology, the same day, however, was particularly bad. Five papers out of nine went by default, and of twelve persons whose names appeared only

four were present. On Thursday morning, in the Section of Medicine, out of seven papers six were read, and in Surgery not one was missed; in Pathology and Obstetrics all were read by the writers and one by a substitute. The Section of Eye, Ear, Nose and Throat, had no delinquents. On Friday, in Medicine, four papers out of seven were read; and in Surgery there was only one omission out of six; in Obstetrics all the readers were present, and in Pathology all but two.

The Address in Medicine was of a high order, and Dr. W. P. Heringham, of London, maintained the reputation of his school for a scholarly and pains-taking presentation of the subject. The Address in Surgery by Dr. John B. Murphy, of Chicago, was listened to with much interest.

An important action of the Association was the final decision to establish a JOURNAL. The final arrangements were left with the Finance Committee, and we understand that they have certain proposals before them which will be considered immediately. So far as we can learn at present the JOURNAL will probably be edited in Montreal, and issued at the beginning of the year.

For the present year, Dr. G. E. Armstrong is President-elect, and Dr. E. W. Archibald, Secretary. Both of these officers are from Montreal where the next meeting will be held. Montreal is in the habit of doing these things well, and we feel quite sure that in 1911 no departure will be made from a good tradition.

MEDICAL EDUCATION IN AMERICA.

A great service has been rendered to medical education on this continent by the publication of a bulletin by the Carnegie Foundation for the Advancement of Teaching (No. 4) on "Medical Education in the United States and Canada," prepared by Mr. Abraham Flexner and others. In the vigorous introduction with which he prefaces a volume of some 350 pages, teeming with facts and figures, President Pritchett makes the interesting announcement that, "it is the purpose of the Foundation to proceed at once with a similar study of medical education in Great Britain, Germany, and France, in order that those charged with the reconstruction of medical education in America may profit by the experience of other countries."

The Carnegie Foundation has been in existence only five years, but ample proof is here afforded of its desire to impress its beneficent activity on a department of education which touches more nearly than any other both the individual and the community. For it may be well

said, in the words of the Bulletin, "In no other way does education more closely touch the individual than in the quality of medical training which the institutions of the country provide. Not only the personal well-being of each citizen, but national state and municipal sanitation rests upon the quality of the training which the medical graduate has received. The interest of the public is to have well-trained practitioners in sufficient numbers for the needs of society. The source whence these practitioners are to come is of far less consequence."

The gist of the whole argument is that there are too many medical schools, and that no public interest would suffer if many of them were discontinued or suppressed. With the great extension of the fundamental sciences on which medicine depends, the requirements of medical education have increased enormously, and much heavier demands are now made on both teachers and students in respect alike of preliminary and of professional training. Medical education, properly provided, has come to be the costliest of all. Scientifically trained physicians and surgeons, and specialists of every kind, are of greater importance even than able all-round practitioners, and it becomes a question whether better results could not be obtained by concentrating educational effort on fewer centres.

Accordingly, one of the most suggestive features of the report is the maps (pp. 152-3) showing (a) the actual and (b) the suggested number, location and distribution of medical schools in the United States and Canada. "Progress for the future would seem to require a very much smaller number of medical schools, better equipped and better conducted than our schools now as a rule are; and the needs of the public would equally require that we have fewer physicians graduated each year, but that these should be better educated and better trained."

This will seem to many a large argument, but the Bulletin fairly teems with reasons why it should be taken seriously. We are told, on page 14, that Professor Paulsen, describing in his book on the German Universities the increased importance of the medical profession, reports with some astonishment that the number of physicians has increased with great rapidity, so that there now is, in Germany, one doctor for every 2,000 persons, and in the large cities one for every 1,000." What would the amazed philosopher have said, asks Mr. Flexner, had he known that in the entire United States there is already on the average one doctor for every 568 persons, that in our large cities there is frequently one doctor for every 400 or less, that many small towns with less than 200 inhabitants each have two or three physicians apiece? It is something of a relief to be told elsewhere (p. 150) that "in Canada the existing ratio of physicians to population is 1:1030." The whole paper cannot

be adequately dealt with within the limits of a single article, and we shall consider here only the general aspect of the subject, especially in its bearing on Canada, leaving out of consideration for the present the very valuable parts of the Bulletin (Chaps. IV. to VII.) which deal with the course of study, in college and hospital.

The main source of trouble is the commercial medical school. No one can read the opening chapters of Mr. Abraham Flexner's carefully compiled report without feeling that he has put his finger on an evil which, however much it might be palliated or excused under by-gone conditions, cannot now be allowed to survive without grave prejudice to the public interest. "It is a singular fact," says President Pritchett, "that the organization of medical education in this country has hitherto been such as not only to commercialize the process of education itself, but also to obscure in the minds of the public any discrimination between the well-trained physician and the physician who has had no adequate training whatsoever. A vast army of men is admitted to the practice of medicine who are untrained in sciences fundamental to the professional and quite without a sufficient experience of disease. A right education of public opinion is one of the problems of future medical education" (p. X.).

As illustrating the instability of the type of school above referred to, the fact is recorded that in little more than a century the United States and Canada produced no fewer than 457 medical schools, "many, of course, short-lived, and perhaps 50 still-born." By a partial process of elimination this number has now been reduced to 155. The rest could not survive. "Nothing has perhaps done more to complete the discredit of commercialism than the fact that it has ceased to pay. It is but a short step from an annual deficit to the conclusion that the whole thing is wrong anyway." And the conclusion is drawn in these words: "It appears, then, that the country needs fewer and better doctors; and that the way to get them better is to produce fewer. To support all or most present schools at the higher level would be wasteful, even if it were not impracticable; for they cannot be manned. Some day, doubtless, posterity may re-establish a school in some place where a struggling enterprise ought now to be discontinued. Towards that remote contingency nothing will, however, be gained by prolonging the life of the existent institution" (pp. 17-18), Cp. p. 49.

In addition to an exhaustive statement of the features of an up-to-date medical curriculum, the Bulletin deals with such questions as entrance standards and the length of the course. In the United States the required curriculum, prior to practice, now covers four years. A hint of what may be expected from a comparison with European conditions

is given in a note on p. 104, quoted from the *British Medical Journal*, September 5, 1908, p. 634: In Germany five years must be spent at the University, a sixth in a hospital; in England "official statistics published recently under the authority of the General Medical Council show that the mean length of the curriculum in the case of 1,111 students investigated was three weeks less than seven years; only 14 per cent. succeeded in obtaining a qualification in the minimum period of five years, 35 per cent. obtained it in the sixth year, 18 per cent. in the seventh year, 13 per cent. in the eighth year. When the remaining 20 per cent. obtained it does not appear, probably never. Looking at the figures in another way, we find that at the end of six years less than half had obtained a qualification for registration, and at the end of seven years only two-thirds."

For American schools it is argued that five years of purely medical study have come to be indispensable. Against the suggested compromise of a five years' course, with the first year devoted to the fundamental sciences of physics, chemistry and biology, Mr. Flexner details the following objections: (1) A single year is insufficient for three laboratory courses, and makes no provision for modern languages; (2) the day is coming when the medical school proper will want a fifth or hospital year, —a culmination that will be indefinitely postponed if the year in question is prefixed to the course and assigned to preliminary training; (3) The arrangement protracts our present educational disorganization: it proposes that the medical school should do the work of the college (pp. 47-8).

The length of the course obviously hangs by the question of entrance qualifications, and the *Bulletin* is full of scathing condemnation of those institutions that ask for "little or nothing more than the rudiments or the recollection of a common school education." McGill and Toronto are commended under this head (though neither of them as yet requires two years of college work for entrance), on the ground of the control exercised by the University authorities over admission to their medical departments.

Those who have been watching the development of a "closer union" between the University and its medical school, will learn from the *Carnegie Bulletin* that what has recently been brought to pass in Montreal took place long ago in the United States. "The first step towards depriving the medical school of virtual autonomy was taken when the University undertook to collect the fees and thenceforward to administer the finances of the department by means of an annual budget. This took place at Harvard in 1871, at Yale in 1880, at the University of Pennsylvania in 1896" (p. 8, note). "Early in the seventies the new

president of Harvard College startled the bewildered faculty of its medical school into the first of a series of reforms that began with the grading of the existing course and ended in 1901 with the requirement of an academic degree for admission. In the process, the University obtained the same sort of control over the medical department that it exercises elsewhere. Towards this consummation President Elliott had aimed from the start" (p. 12). On the modern movement towards the identification of the Medical School and the University the following recent papers are important: The Obligations of the University to Medical Education, by President Pritchett, in the Journal of the American Medical Association, April 2, 1910: vol LIV., pp. 1109-1114; The Relation of the University to the School of Medicine, *ibid*, April 16, 1910, pp. 1281-1284.

In other respects also our Canadian medical schools, with McGill and Toronto always at their head, come in for very considerable commendation. "It is important that our universities realize that medical education is a serious and costly venture; and that they should reject or terminate all connection with a medical school unless prepared to foot its bills and to pitch its instruction on a university plane. In Canada conditions have never become so badly demoralized as in the United States. There the best features of English clinical teaching have never been wholly forgotten" (p. 13). "The graduates of McGill and Toronto have passed through a scientific and clinical discipline of high quality" (p. 15). Special praise is accorded to the "great anatomical and pathological museum at McGill" (p. 82). For more extended quotation the following passage is of interest (pp. 78-9). "Of schools of this type two Canadian institutions—McGill and Toronto—deserve special attention. In point of laboratory equipment they equal Minnesota and Michigan; their lower entrance requirement, minimized by conscientious adherence to a strict interpretation of their announced standards, is now compensated by the addition of a fifth year to the curriculum.

At Toronto the teaching is wholly in charge of full time instructors, for whose original work splendid provision has been made in laboratories of ideal construction and admirable equipment. McGill is in respect to full-time teachers somewhat less fortunate; but its great museum, recently much damaged by fire, proves that genuine enthusiasm may succeed contrary to all the established rules of the game. In both institutions the shortcomings of the student body, instead of excusing perfunctory work, have rather been regarded as an obstacle to be overcome, a condition to be met. The students have had little high school science all the more reason, then, to provide excellent laboratories, skilful teachers, abundant assistants. In keeping with effective performance are their

modesty and candour. The number of greatest anatomists and greatest pathologists teaching on small salaries in obscure places in the United States, and of laboratories as good as Johns Hopkins is nothing less than staggering. Nor is a boastful pride in mediocrity lacking even in institutions of some real merit. At Toronto and McGill one hears in the medical school no such bravado. There they deprecate the defects, which they hasten to show for fear they may escape notice. The absence of competition—be it business competition between schools conducted for profit, or academic competition between endowed or tax-supported institutions, made to “make a showing”—may, perhaps, be responsible for their more guarded utterance and more assured ideals.”

Carefully arranged statistics of all medical schools in America are provided in an appendix (Canada pp. 320-326).

Recurring to the general argument so exhaustively set forth in the Bulletin, we may best enforce its main drift and tendency by quoting again from President Pritchett's Introduction (pp. x-xi): “The significant facts revealed by this study are these:

(1) For twenty-five years past there has been an enormous overproduction of uneducated and ill-trained medical practitioners. This has been in absolute disregard of the public welfare and without any serious thought of the interests of the public. Taking the United States, as a whole, physicians are four or five times as numerous in proportion to population as in older countries like Germany.

(2) Over production of ill-trained men is due in the main to the existence of a very large number of commercial schools, sustained in many cases by advertising methods through which a mass of unprepared youth is drawn out of industrial occupations into the study of medicine.

(3) Until recently the conduct of a medical school was a profitable business, for methods of instruction were mainly didactic. As the need for laboratories has become more keenly felt, the expenses of an efficient medical school have been greatly increased. The inadequacy of many of these schools may be judged from the fact that nearly half of all our medical schools have incomes below \$10,000, and these incomes determine the quality of instruction that they can and do offer.

Colleges and universities have in large measure failed in the past twenty-five years to appreciate the great advance in medical education and the increased cost of teaching it along modern lines. Many universities desirous of apparent educational completeness have annexed medical schools without making themselves responsible either for the standards of the professional schools or for their support.”

THE CANADA MEDICAL ACT.

The cause of Dominion Registration was advanced another step at the recent meeting of the Canadian Medical Association, in Toronto. The Amendments to the Canada Medical Act suggested by the Committee representing the Provinces, which met Dr. Roddiek in November last, were unanimously adopted at one of the general sessions of the Association.

The Bill now gives two representatives to each of the Provinces, to be elected under regulations to be made by the Provincial Medical Councils. The larger Provinces, be it said to their credit, gave way on this difficult question so that the little Island of Prince Edward will now have the same representation on the Dominion Council as the large Province of Ontario. On the other hand the universities will increase the representation of Manitoba, Ontario, Quebec, and Nova Scotia. All told the Dominion Council will now have a membership of thirty-one.

It was decided that every candidate for the Dominion license must either have a Provincial License, or must present a certificate from the Registrar of his own Provincial Medical Council that he holds a medical degree accepted, and approved of, by the Medical Council of said Province.

The terms of the Retroactive Clause already referred to in these pages, were adhered to, namely, that after ten years any practitioner in good standing may claim a Dominion License without examination. But it shall be competent for the Medical Council of any Province, not satisfied with the period of years prescribed to exact from practitioners an examination in the final subjects only. It is not expected that all the provinces will avail themselves of this provision, although it was thought well to have such a safe-guard in the event of a stampede towards any province.

The Reciprocity Clauses in the Original Bill were all expunged, being really unnecessary since the passage of the Laurie Amendment to the British Medical Act, which provides that any Province may, through its Legislature, when so minded arrange a scheme of reciprocity with the British Medical Council.

The Amended Bill will be submitted to the Dominion Parliament at its next session and will come into force just as soon as all the Provinces shall have secured their enabling clause from their respective legislatures.

THE NATIONAL ASSOCIATION FOR THE PREVENTION
OF TUBERCULOSIS.

It is not, perhaps, generally known and recognized that the Federal

Government, debarred, as it holds itself from actively taking part in the prevention of disease in man, by the British North America Act, save in the matter of the supervision of the health of immigrants, has nevertheless for several years past supported and in fact borne the whole expenses of the National Association for the Prevention of Tuberculosis, affording this year a grant of \$10,000 annually to that body. The object of the Association is to bring together all throughout the Dominion interested in the arrest of Tuberculosis,—the Provincial and Municipal Boards of Health, the Provincial Anti-tuberculosis Associations, municipal leagues, and private corporations, which have established dispensaries, sanatoriums, and hospitals for the cure of the consumptive and by the annual assemblage of delegates from these various bodies to keep the one in touch with what the other is accomplishing, and thereby to induce a generous emulation between the various provinces and municipalities. The central office, in Ottawa, forms a centre for information and for the publication of campaign literature. Until last year the annual meetings were held in Ottawa; last year the policy was embarked upon of stimulating local effort by holding the annual meetings in different centres. Hamilton, with its admirable sanatorium just established on the outskirts of the city, was chosen for the first of these peripatetic meetings; this June the Royal Edward Institute invited the Association to meet here in Montreal; the Hon. Adam Beck conveyed an invitation that next year's meeting be held in London, where but a few weeks ago as the result of an enthusiastic campaign there was opened what is, perhaps, the most conveniently and beautifully situated and equipped sanatorium and hospital yet established in Canada.

The main feature of the late meeting was the evidence afforded from one end of the Dominion to the other of active progress. Ontario takes the lead with its Government grant of \$4,000 towards the erection of sanatoria and hospitals in any county, and of a capitation fee of \$4.50 per patient in those institutions. As a result, Ottawa has just built and opened the Lady Grey Hospital of thirty beds, Hamilton has both the Mountain Sanatorium for thirty patients, and the Southam Hospital for Incurables, London, has its combined hospital, sanatorium and farm for an equal or greater number of patients, St. Catharines, Guelph and Brockville are following the lead, and will shortly be fully equipped. Toronto has established a league similar to ours in Montreal, and has brought together its various agencies, which report increased activity. There the Heather Club working in connexion with the Children's Hospital besides employing visiting nurses, is the first body in Canada to establish an open air school for tuberculous and scrofulous children.

British Columbia reports a complete organization, under the leadership of Dr. E. T. Fagan, with some forty local associations throughout the Province, and the completion of a central sanatorium and hospital at Tranquille, near Kamloops, with accommodation for fifty patients, and a farm of several hundred acres which will employ a large number of convalesced patients. Saskatchewan, under the active direction of Dr. Seymour, head of the Health Department, has during the last few months established twenty local associations and is about to build a provincial sanatorium. All the Western Provinces, it may be noted, receive Government support per capita for the care of cases of tuberculosis in connexion with the general hospitals. The same enthusiastic reports of active progress were received from province after province in succession, so much so that Canada should be a formidable candidate next year, for the prize given at each successive meeting of the International Tuberculosis Congress for the country that has made the greatest progress during the last three years.

Reference must be made to the admirable and practical address delivered by General Sternberg, late head of the U. S. Army Medical Department upon the housing of artisans in relationship to the spread of tuberculosis. General Sternberg is the head of two organizations in Washington which during the last twelve years have built three hundred houses, each housing two families in from three to five rooms, each family being provided with a bath and range with hot and cold water, the shareholders being guaranteed 5 per cent., and the popularity of these cottages having led to some thousand other cottages of the same type being erected by private individuals. There is a wide opening for associations of this type in Montreal.

At Laval University, Drs. Rousseau, Bourgeois and Dubé gave admirable addresses bearing upon the progress made in Quebec, Three Rivers, and Montreal, respectively; Dr. Dubé especially discussing the movement to improve the milk supply. More immediately bearing upon the treatment of tuberculosis was an excellent discussion opened by Dr. Harding upon dispensary methods and a demonstration by Dr. Campbell Howard upon the "Class Method" that excited great interest.

Medical News.

FORTY-THIRD ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION.

TORONTO, JUNE 1ST, 2ND, 3RD AND 4TH, 1910.

SUMMARY OF PROGRAMME.

Wednesday, June 1st.—Morning session.

SECTION OF MEDICINE.

1. *Treatment of Acne Vulgaris by Vaccines.*—George W. Ross, Toronto. Discussion opened by D. King Smith, Toronto.

2. *Diphtheria.*—A. H. Gordon, Montreal. Discussion opened by A. R. Gordon, Toronto.

3. *The Psycho-Neuroses.—Psycho-Analysis.*—J. J. Putnam, Boston; August Hoch, New York. *In Asylum Practice.*—W. H. Hattie, Halifax. *General Significance.*—Ernest Jones, Toronto. Discussion opened by C. K. Clarke, Toronto.

4. *Radium Therapy.*—W. H. B. Aikins, Toronto, read by title.

5. *Some Unusual Symptoms of Exophthalmic Goitre.*—F. P. White, Shelburne, read by title.

SECTION OF SURGERY.

1. *Tumor of Cerebrum (with patient).*—Geo. Bingham, Toronto. Discussion opened by James Bell, Montreal.

2. *The Operative Treatment of Congenital Hydrocephalus.*—Edward Archibald, Montreal. Discussion opened by B. Z. Miller, Toronto.

3. *Perforation of the Intestines in Typhoid Fever.*—G. E. Armstrong, Montreal. Discussion opened by Ingersoll Olmsted, Hamilton.

4. *Tuberculous Invasion of Voluntary Muscle.*—A. Primrose, Toronto.

4. *A Case of Diaphragmatic Hernia.*—J. M. Cotton, Toronto.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

1. *A Case of Pregnancy Complicated by large Fibromyoma of the Uterus, Caesarian Section, Myomectomy.*—W. J. Hunter Emory, Toronto, Ont.

2. *Prenatal Influences.*—Jennie Gray, Toronto, Ont.

3. *The Obstetrical Technique, the Management of Labor, Methods, etc.*—J. G. Bogart, Kingston, Ont.

SECTION OF PATHOLOGY.

1. *A Study of the Pathological Findings in Eighty Cases of Acute Pericarditis.*—Joseph Kaufmann and Raymond Landry, Montreal, Que. This was presented by W. F. Hamilton, Montreal, Que.
2. *A Teratoma of the Testicle.*—A. B. Atherton, Fredericton, N.B.
3. *Rabies.*—J. A. Amyot, Toronto, Ont.
4. *The Actions of Drugs on the Salivary and Bronchial Secretions.*—A. H. Taylor and V. E. Henderson, Toronto, Ont.

GENERAL SESSION, JUNE 1ST.

1. Chair taken by the retiring President, R. J. Blanchard, Winnipeg.
 2. *Invocation.*—R. A. Falconer, J.L.D., etc., President, University of Toronto.
 3. *Induction of President Elect.*—Dr. Adam H. Wright, Toronto.
 4. *Address of Welcome.*—His Honor, the Lieut.-Governor of Ontario.
 5. *Address of Welcome.*—His Worship, the Mayor of Toronto.
 6. *Address of President.*—Adam H. Wright, Toronto.
 7. *General business.*
 8. *Report of Milk Commission.*—Charles J. C. O. Hastings, Toronto.
- The Municipality and Its Milk Supply.*—H. A. Evans, Commissioner of Health, Chicago. *A Pure Milk Supply.*—Charles E. North, New York.
- Discussion.*—Opened by A. McGill, Ottawa, Ont., Dominion Analyst; J. G. Rutherford, Veterinary Director General, Ottawa, Ont.; Hon. H. E. Young, Provincial Secretary, Victoria.

GENERAL SESSION, JUNE 1ST—EVENING.

1. *Address in Medicine.*—W. P. Heringham, London, England.
2. *Discussion on Dominion Registration.*—Opened by T. G. Roddick, Montreal.
3. *Annual Executive Session of the Ontario Medical Association.*—The President, H. R. Casgrain, Windsor, in the Chair.

Thursday, June 2nd.

SECTION OF MEDICINE.

1. *Diagnostic and Prognostic Importance of Sensory Phenomena in Progressive Pernicious Anaemia.*—Hugh McCallum, London. Discussion opened by W. B. Thistle, Toronto.
2. *Pernicious Anaemia.*—C. F. Martin, Montreal. Discussion opened by H. C. Parsons, Toronto.

3. *Psycho-Neuroses from the Standpoint of the Neurologist*.—Joseph Collins, New York. Discussion opened by D. C. Meyers.

4. *Levulosuria and its Significance in the Diagnosis of Hepatic Conditions*.—W. F. Hamilton, Montreal.

5. *Pneumococcic Arthritis*.—D. McCordick, Montreal. Discussion opened by J. T. Fotheringham.

6. *Tuberculosis of the Mediastinal Glands*.—Harold C. Parsons, Toronto.

SECTION OF SURGERY.

1. *Omental Cysts*.—Murray MacLaren, St. John, N.B.

2. *Appendicitis in Children*.—I. Wood, Kingston, Ont. Discussion opened by C. B. Shuttleworth, Toronto, Ont.

3. *Duodeno-choledochotomy, with Report of a Case*.—Jaspar Halpenny, Winnipeg, Man. Discussion opened by J. M. Elder, Montreal, Que.

4. *Acute Intestinal Obstruction, with special reference to some experimental work on the secretions of the upper intestines*.—Hugh McKenna, Chicago.

5. *A Case of Renal Calculus with Nephrectomy*.—W. Warner Jones, Toronto, Ont. Discussion opened by Samuel Cummings, Toronto.

6. *A Case of Obstruction of Bowels due to Torsion of the Caecum and Ascending Colon*.—Ingersoll Olmsted, Hamilton, Ont.

7. *Exomphalos*.—M. R. Blake, Winnipeg, Man.

Thursday, June 2nd.

SECTION OF OBSTETRICS AND GYNECOLOGY.

In Conjunction with Section of Pediatrics.

1. *The Causation and Early Diagnosis of Uterine Cancer*.—A. C. Hendrick, Toronto.

2. *Pyelitis in Pregnancy—Cystoscopic Diagnosis, with report of cases*.—Ellice MacDonald, New York.

3. *Cystitis following Operations*.—F. A. Cleland, Toronto. Read by Dr. Lytle.

4. *Pericarditis in Children with Demonstration by X-Ray Photographs*.—Joseph S. Graham, Toronto.

SECTION OF PATHOLOGY.

1. *The Noguchi Method of Serum Diagnosis of Syphilis. Its Practical Value*.—Daisy M. Orleman Robinson, New York.

2. *The Wasserman Reaction from a Laboratory and Practical Standpoint.*—F. S. Patch and R. P. Campbell, Montreal.

3. *A Critique of the Wasserman Reaction and Its Modifications.*—J. G. Fitzgerald, Toronto.

4. *Immunological Procedures and Their Value in Pulmonary Tuberculosis.*—A. H. Caulfield and J. C. Beattie, Gravenhurst, Ont.

6. *A Complement Deviation in Pulmonary Tuberculosis.*—A. H. Caulfield and J. C. Beattie, Gravenhurst, Ont.

7. *Further Observations on a New Tuberculin Skin Test.*—Sydney Pierce, Winnipeg.

8. *The Clinical Estimation of the Coagulation of the Blood.*—R. D. Rudolf, Toronto.

SECTION OF EYE, EAR, NOSE AND THROAT.

1. Symposium: The Neurasthenic Conditions referable to the Eye, Ear, Nose and Throat.

(a) *The Eye.*—R. S. Minnes, Ottawa, Ont.

(b) *The Ear.*—D. J. Gibb Wishart, Toronto, Ont.

(c) *The Nose and Throat.*—W. H. Jamieson, Montreal, Que. Discussion opened by J. P. Morton, Hamilton, Ont.

2. *The Diseased Tonsil.*—(a) *Its effect upon the general system.*—W. P. Caven, Toronto, Ont. (b) *Its surgical treatment.*—J. G. Sutherland, St. Catharines, Ont. Discussion led by Price Brown, Toronto, Ont.

3. *Trachoma.*—H. S. McKee, Montreal. Read by E. H. White. Discussion opened by J. D. Page, Quebec.

4. *Nasal Polypi.*—C. C. McCullough, Fort William, Ont. Discussion opened by Geoffrey Boyd, Toronto.

5. *Mastoid Disease in Infants. Parinaud's Conjunctivitis.*—G. D. Mathewson, Montreal.

6. *Reflex Nasal Neuroses.*—*Asthma, Hay Fever, Paroxysmal Sneezing.*—C. M. Stewart, Toronto. Discussion opened by F. J. R. Forster, Stratford, Ont.

7. *A Case of Antral Disease with Serous Exudate (Sinusitis Serosa).*—E. Hamilton White, Montreal.

8. *Case Report: Benign New Growths of the Nasal Septum.*—H. D. Hamilton, Montreal.

Afternoon.

The members of the Association and ladies went to Niagara Falls as the guests of the Toronto members.

Friday, June 3rd.

SECTION OF MEDICINE.

1. *Tuberculin in Pulmonary Tuberculosis*.—J. H. Elliott, Toronto. Discussion opened by Charles Parfitt, Gravenhurst.
2. *The Blood in Pulmonary Tuberculosis*.—A. F. Miller, Kentville. In collaboration with L. Brown and J. S. Lupton, Saranac Lake.
3. *Orthostatic Albuminuria*.—Graham Chambers, Toronto.
4. *Sudden Attacks of Pain in the Pyloric Region*.—Goldwin Howland, Toronto.

SECTION OF SURGERY.

1. *Case Reports showing the Difficulties of the Diagnosis between Tuberculosis of the Lower Vertebrae and Hip Disease*.—A. McKenzie Forbes, Montreal. Discussion opened by Clarence L. Starr, Toronto. Toronto.
2. *Fractures about the Elbow Joint*.—W. E. Gallie, Toronto.
3. *Regeneration of Shaft of Tibia following Extensive Osteomyelitis*.—Alex. Hutchison, Montreal. Discussion opened by John Stewart, Halifax.
4. *Experimental Intra-thoracic Surgery*.—E. M. Von Eberts, Montreal.
5. *Complications of Recurrent Carcinoma of the Breast*.—J. M. Elder, Montreal.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

1. *Demonstrations of Occipito Posterior Positions with a Model*.—J. R. McCabe, Strathroy.
2. *Ectopic Pregnancy*.—W. W. Chipman, Montreal.
3. *The Physical Examination of the Ante-Partum, and Post-Partum Patient with use of the Pelvimeter*.—Herbert M. Little, Montreal.
4. *The Immediate Repair of the Cervix and the Preliminary Placing of the Suture in the Perineum*.—A. Laphorn Smith, Montreal.
5. *Placenta Praevia*.—F. Fenton, Toronto.

SECTION OF PATHOLOGY

1. *Concerning the Development of the Spirochaeta Duttoni*.—J. L. Todd, Montreal.
2. *The Bacteriology of Acne Vulgaris*.—George W. Ross, Toronto.
3. *Trachoma Bodies*.—W. H. Lowry, Toronto.
4. *The Estimation of Nitrogen and Ammonia in Urine*.—J. B. Leathes, Toronto.

5. *The Occurrence of a Fat-splitting Ferment in the Urine in Cases of Pancreatitis.*—Edward Archibald, Montreal.

6. *The Clinical Estimation of Faeces.*—F. W. Rolf, Toronto.

7. *The Action of the Glomeruli of the Kidney.*—T. G. Brodie, Toronto.

GENERAL SESSION.

1. *Address in Surgery.*—The Surgery of the Joints—John B. Murphy, Chicago.

2. *Symposium on Exophthalmic Goitre.*—The Medical Aspect—Alex. McPhedran, Toronto. The Surgical Aspect—F. J. Shepherd, Montreal. The Pathological Aspect—S. P. Beebe, New York.

3. *Annual Meeting Canadian Medical Protective Association.*—The President, Dr. R. W. Powell, of Ottawa, in the Chair.

GENERAL SESSION—EVENING.

1. *Address in Gynaecology.*—The Old and New Gynaecology—Henry C. Coe, New York.

2. *Medical Education.*—A comparison of the Conditions of Twenty-five Years ago with those of the Present. A suggestion for the Organization within the Association of a Permanent Committee on Medical Education—J. C. Connell, Kingston.

3. *Medical Inspection of Immigrants.*—J. D. Pagé, Quebec.

Saturday, June 4th.

GENERAL SESSION.

General Business.—The members of the Association, with their ladies, went to Guelph as the guests of the profession of that city, and of the President and staff of the Agricultural College.

McGILL MEDICAL CONVOCATION.

The 78th Annual Convocation for conferring Degrees in Medicine and Dentistry was held in the Royal Victoria College, Thursday, June 9th, 1910.

The Principal presided; and of the Governing Body E. B. Green-shields, LL.D., was present. Members of the Faculty, of the Staff, and of Convocation to the number of 53 were in attendance, and the Hall was quite filled by undergraduates and the public.

The following Honour List was presented:—

Fourth Year.—Holmes' Gold Medal for highest aggregate in all subjects forming the Medical Curriculum, T. A. Robinson, St. Mary's. Final Prize, for highest aggregate in the Fourth Year Subjects, H. Macmillan, Victoria. Wood Gold Medal, for best examination in all the Clinical Branches, Sidney B. Peele, New Westminster. Woodruff Gold Medal, for special examination in Ophthalmology and Oto-Laryngology, Sidney B. Peele, New Westminster. McGill Medical Society Senior Prize, D. M. Brown, Motherwell, Scotland.

Third Year.—Third Year Prizeman, F. H. Mackay, Mount Stewart, P.E.I. Sutherland Medallist, D. S. Lewis, M.Sc., Montreal. Joseph Hils Prize, C. D. Hamilton, Cornwall. Morley Drake Prize, F. H. Mackay, Mount Stewart, P.E.I. McGill Medical Society Junior Prize, E. H. Falconer, Prentice, Wis.

Second Year.—Second Year Prizeman, A. L. Jones, Victoria. Senior Anatomy Prize, W. G. Morris, Regina.

First Year.—First Year Prizeman, C. R. Joyce, Woodstock. Junior Anatomy Prize, C. R. Joyce, Woodstock.

The Degree of M.D., C.M., was conferred on the persons, 79 in number, whose names follow, alphabetically arranged:—Allen, John Anson Lorne; Allen, Kenneth Watson; Allingham, John Heber, B.A.; Amant, Harry; Anderson, William Marcus; Baldwin, William James; Benner, Frank Aubrey; Black, Vaughan Elderkin, B.A.; Booth, Gordon Elliott; Boudreau, Frank George; Brown, David MacCulloch; Burton, William Elliott; Carruthers, Robert Sim Patterson; Champion, Benjamin Hiram; Chisholm, Hugh Gillis, B.A.; Crease, Arthur Lionel; Culver, Cyrus Whitney; Dakin, Warren Augustus, M.A.; Doyle, Philip Ernest; Dunbar, David Archibald; Dunnet, Henry Watters; Elliott, Robert, B.A.; Ewert, Carl, B.A.; Fraser, John Roger; Fraser, Wilbert Grieve; Froomess, Leo E.; Gallagher, Joseph Bernard, B.A.; Gillis, Stephen Herbert; Gilmour, William Norman; Graves, Charles Allan; Hepburn, Howard Havelock; Hepburn, William Graham; Herbert, Thomas Archibald; Hicks, Elbert, Roy, B.A.; Hutchinson, George Wellington; Keay, Arnold; Lavers, Percy Lorne; Locke, J. Allan; Lockwood, Ambrose Lorne; Logie, H. Burton, B.A.; McAlister, William Jonas; Macaulay, Albert Edward; McBurney, Albert, B.A.; McCracken, William Alexander; McEachren, Malcolm Thomas; Mackintosh, Arthur Emerson; MacMillan, Hugh; MacMillan, Stanley; McNaughton, Murray William Armour; MacNeill, Alvin Lennox Hodge; MacPhee, John Adolphus, B.A.; Malcolm, Robert Bruce; Marchant, Harold Bertram; Moodie, Alex. Russell; Morse, David Garnet; Mundie, Gordon Stewart, B.A.; O'Brien, John Francis; O'Callaghan, Robert Hay Lismore; Park, John

Edmestone; Patten, Lee Alfred; Peabody, Harry Sherman; Peele, Sidney Beresford; Piper, John Obed, A.B.; Raphael, Howard MacLaren; Reed, Everett Hobart; Richardson, James Wilson; Robinson, Thomas Arnold; Scott, George Orville; Shephard, Harold Middleton; Shillington, Richard Newton Wellington; Sihler, George Albert; Sinclair, Fred Douglas, B.A.; Speer, Robert Brandon; Stewart, Archibald; Strudwick, Henry Thompson; Turner, John Smicle; Walker, Edmund Eugene Watlington; Wilson, George Thomas, B.A.; Youland, William Edward, A. B.

The Valedictory by the graduates was given by Dr. Thomas A. Robinson. Prof. T. Wesley Mills replied on behalf of the Faculty. Dr. Mills was then presented with an address accompanied by a gift from members of the Faculty and of the teaching staff, to which he made a suitable reply. The honorary degree of M.D., C.M. was conferred upon Dr. Maude Abbott, M.D. (Bishop's); and degrees *in absentia* were conferred upon William E. Fairfield, M.D.; Hyman Lightstone, M.D.; Douglas Dalzell Macrae, M.D.; Samuel W. Outwater, M.D.

Dr. F. J. Shepherd, Dean of the Faculty gave the sessional address, which was as follows:—

The total number of students registered in the Faculty of Medicine for the past session was 332, made up as follows:—

First year	81
Second Year	61
Second Year (four year course)	12
Third Year	39
Third Year (four year course)	26
Fourth Year	89
	<hr/>
Total	312

In the Dental Department there were:—

First Year	6
Second Year	4
Third Year	3
Fourth Year	4
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Total	17

Graduates in attendance, D.P.H. Course 3

Making a grand total of 332.

The students come from the following provinces:—

Ontario	79
Quebec	67
New Brunswick	26
Prince Edward Island	19
United States	40
West Indies	18
Newfoundland	4
Nova Scotia and Cape Breton	21
British Columbia	38
Manitoba	5
Alberta and Saskatchewan	9
Scotland	1
England	1
British Guiana	4
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Total	332

The seventy-eighth session of the Faculty of Medicine closes to-day with the graduation of seventy-nine men. This is really the 81st year since the union of the old Montreal Medical Institute with McGill University, for during the Rebellion of '36, '37 and '38 no sessions were held. This year is memorable as being the last one with a graduating class having a four year course.

It was arranged that this year should close with the opening of our medical buildings on Pine Avenue and University Streets, but the sudden and lamented death of our most gracious Sovereign, King Edward VII prevented this; for His Excellency, the Governor-General could not be present, and it was thought better to postpone the opening, as well as the Reunion of Graduates, until next year,—this had the approval of Lord Strathcona and the College authorities. Next year we hope to have a reunion of all our graduates as well as the official opening of the new buildings for by that time the West Wing (already commenced) will be finished and we shall celebrate the opening of a completed building and have so much the more to show our graduates.

Besides, the Museum and Library will then be in order and our graduates will have a much better idea of the great importance of these two magnificent departments. Last year at the Convocation we were hoping that some kind friend would give us enough to build the Museum the plans of which were already arranged for, and an appeal was made for more money for this purpose. In July last the Principal saw Lord Strathcona. in London, with the result that he gave us \$450,000 to com-

plete the buildings and \$50,000 to augment professors' salaries. This most munificent gift was accepted with gratitude and joy. To Lord Strathcona we owe much. He has ever come forward to help us in our difficulties and tided us over many a serious trouble. Now not only are we able to have a great museum, but we are also able to complete the building by adding the West Wing so that the symmetry of this splendid structure will not be spoilt.

I have to report that the Dental Department is in a very flourishing condition and this is due to the generosity of the Montreal General Hospital which established a dental clinic at considerable expense. Now we can educate English dentists and give them as great facilities for acquiring a practical knowledge of their profession as they can get in larger centres in the United States. Dr. J. Ibbotson has been appointed Director of this clinic. Not only is this clinic of benefit to students, but it is a great boon to the poor who can have free of charge the best advice and treatment the city can give. During the past winter the children in the various Protestant Institutions have had their teeth attended to with great benefit to their general health.

The Department of Public Health still continues to prosper and this year sends forth three diplomates thoroughly trained in the practical work of that Department.

This Convocation is also made memorable by the giving of an honorary degree to Miss Maude Abbott for her most excellent work in connection with the Museum and also her investigations and research in the little known field of anomalies of the heart. She is the first woman to hold the degree of M.D., C.M. from McGill.

I have now to speak of the resignations which have taken place since we last met. First, Professor Wesley Mills, after a prolonged illness resumed his work last October, but he found he was unable to do justice to his Chair without imperilling his own health, so decided to resign. This resignation was accepted with regret by his colleagues with whom he had worked so long and by whom he was so much appreciated. The address to be presented to-day will express the views of the Faculty towards him so that I need say no more in appreciation of Professor Mills—we wish him God speed wherever he goes.

Professor William Gardner, our senior professor, has intimated to the Faculty his desire to resign from the chair of Gynæcology which he has held since 1883. Previous to this for eight years, 1875 to 1883, Dr. Gardner held the chair of Medical Jurisprudence with satisfaction to the Faculty and the students. In 1883 Gynæcology was separated from Obstetrics and a special chair established to which Dr. Gardner was ap-

pointed; he has held the chair most satisfactorily for 27 years and now wishes to be relieved of the onerous duties incumbent on this position. Every Canadian graduate knows the splendid work Dr. Gardner has done in his department and how much he has advanced the knowledge of his subject in Canada. We all know how careful and accurate he is in diagnosis, how calm and certain in operation, with what sound judgment he gives counsel to his colleagues and how strongly his work is impressed on his students, teaching them to be conservative in a department of surgery which has suffered many things from many indiscreet and so-called progressive surgeons. We regret exceedingly to have to accept the resignation of Dr. Gardner, but he will be still with us and of us for a Professoriate Emeritus will be awarded him.

Professor J. G. McCarthy has also severed his connection with the Faculty in spite of many requests to withdraw his resignation. Professor McCarthy during the past year has been teaching Medical and Surgical Anatomy, previously he was Assistant Professor in Anatomy. Dr. McCarthy has given many of his best years in the service of the College for very little reward and is known to many classes of students as an excellent teacher and organizer and a competent anatomist who has done much to simplify the teaching of that difficult subject and to systematize the practical work. All the students loved him and we all sincerely regret the loss we are sustaining in his resignation.

We accept with regret also the resignation of Dr. W. S. Morrow, Assistant Professor of Physiology, who has done us such yeoman service in the past, and who has during the absence or illness of Professor Mills carried on the duties of the Chair with entire satisfaction. The University is under great obligations to Professor Morrow for having for so many years worked so loyally and with such inadequate recompense; he sacrificed his time, energy and ability on the altar of Science. We regret that the allurements of practice and clinical investigations draw him away from a subject he so long adorned.

Dr. Oskar Klotz, lecturer in Pathology and Bacteriology and pathologist to the Royal Victoria Hospital, by his original work here acquired a continental reputation and when the medical school at Pittsburg was reorganized he was called to the professorship of pathology, a great compliment to him and to us,—although we regret his loss we rejoice in his promotion.

Dr. S. B. Wolbach, who has been lecturer in Histology and Pathology and pathologist to the Montreal General Hospital and whose example has been so stimulating to all who have come in contact with him, has resigned to accept a more distinguished position at Harvard University

in Boston. Dr. Wolbach came here with a reputation of being a progressive and original worker in his subject. He leaves us with that reputation enhanced by his excellent work here and we part with him very reluctantly. May he in his new position continue to increase an already great reputation.

We have also to welcome amongst us for the next session the new professor of zoology, Dr. Willy. He comes to us with a brilliant record of work done and we hope he will be a strong man in his department.

We have also to welcome among our new professors, Associate Professor J. C. Simpson, who takes up the work connected with the department of Embryology and Histology. Professor Simpson's past record leads us to believe that he will do excellently well in this work for he has a reputation as a teacher, expositor and investigator.

In the Dental Department Geo. S. Cameron has been appointed Professor of Prosthetic Dentistry.

Now, I must say a few words in parting to the graduating class. I congratulate you all on having successfully overcome the many obstacles and difficulties which you have met on the road to your degree, but remember that you are only at the commencement of your journey. Some students imagine that the getting of the degree ends the hard work,—on the contrary—you do not know what real work is and it is only when you have the responsibilities of practice that you will realize what a pleasant time your college years were. If you work honestly and steadily at your profession you will be sure to succeed. Be true to yourselves and you will be true to your Alma Mater, who is always watching your successes and failures, rejoicing in your successes and sympathizing in your failures. To encourage you hear what Carlyle says in writing his brother, a doctor:

“It is a noble thing to have a profession in the end; it makes a man independent of all mortals. He is richer than a lord, for no external change can destroy the possession he has acquired for himself.”

Be of good cheer therefore and make up your minds to succeed; you cannot all be great physicians; but you can be good ones; work not for money, but for the love of your profession and you will have your reward. The Faculty wishes you every prosperity in your future career. Farewell.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The fifteenth regular meeting of the Society was held Friday evening, May 6th, 1910, Dr. W. Grant Stewart, President, in the Chair.

(a) CASE OF CÆSAREAN SECTION IN A GIRL OF FOURTEEN YEARS.

(b) ELEPHANTIASIS.

H. L. REDDY, M.D.

W. GRANT STEWART, M.D.—I would like to ask Dr. Reddy in what cases he would consider Cæsarean section indicated. At Bumm's clinic, in Berlin, I did not see any Cæsarean sections, but I saw quite a number of vaginal sections. Of course, there are cases where the vaginal Cæsarean section would not be indicated at all.

I would also like to ask if Dr. Reddy has followed up his cases operated on and what has been the result, that is if the patients have made a perfect recovery.

H. L. REDDY, M.D.—It is rather difficult to lay down a hard and fast rule for performing such an operation. I did a case not long ago where the cervix was not taken up and the os was like iron. The patient went home on the 14th day well. I did another in a case of central placenta prævia and she made an uneventful recovery; also eclampsia. If the head will not go through the pelvis without great difficulty, I think you are perfectly justified in performing the operation, or again if you are going to do so much damage to the woman that it may be a grave case to handle afterwards the balance is in favour of section. It is very difficult to lay down any rule, however. In accouchement forcé the tearing is such that very often a good recovery is not made and you get cicatricial tissue often with involvement of nerves and the woman is more or less damaged and in many cases Cæsarean section would be better. As regards vaginal Cæsarean section it does not appeal to me at all. An operation should, as far as possible, be one that a man of ordinary intelligence should on occasion be able to perform with the smallest amount of assistance compatible with good work. This is not possible in the vaginal operation. With the other operation you can get the skin practically aseptic and this talk of danger in going into the peritoneum is to my mind absolutely childish. In the vaginal operation a lot of assistance is required, the uterus cannot be brought down once in ten cases and it requires a great deal of skill. If a man cannot do a Cæsarean section after he has seen one, he cannot do surgery at all. Sænger very properly puts it that a man has not risen to the requirements of his time

if he cannot perform section when it is called for. It is not a difficult operation, while the other is vastly more difficult. I think the vaginal section is more or less of a show operation and not necessary and I do not think that a thoroughly honest man would put the one against the other, unless in certain exceptional cases.

I have had altogether somewhere between 30 and 35 cases and of these four have died; three of them were impossible cases to have saved and in one there was possibly a faulty technique. In one case the patient had the worst hernia I ever saw after the operation. She was an exceedingly stout woman with 3 to 3½ inches of fat on the abdomen and a dirty greasy skin. The superficial stitches got infected some way or another, then the deep sutures one after another and she had a couple of sinuses for two or three years. We opened the incision and took up these stitches, where there has been any trouble; so far as I know they have all done well.

PATHOLOGICAL SPECIMENS.

W. H. TYTLER, M.D. These specimens were obtained from a woman aged 23 who had had symptoms of endocarditis for about a year; there was a history of chorea at the age of ten. The heart shows very profuse vegetations on the aortic valve, which was incompetent, and some on the mitral valve. The vegetations ran from the left anterior cusp of the aortic valve on to the aortic cusp of the mitral. There were fairly dense adhesions of the pericardium, apparently old pericarditis. About seven or eight days before death she developed paralysis on the right side of the body, and again some four hours before death developed convulsions on the left side. On the right surface of the cortex there was extensive blood clot; and in the right temporo-sphenoidal lobe was a large hæmorrhage. The right middle cerebral artery was thrombosed to its origin. The spleen showed recent infarction, the liver showed a marked degree of nutmeg, and the kidney some scars of old infarcts; there was also parenchymatous nephritis.

The other specimens are those of the bladder and kidneys of a man who had had a chronic abscess of about six months' standing in the perineum. It had formed a fistula into the posterior urethra and urine came away through the sinus for some time. The bladder shows an ulcerative cystitis and a diverticulum about the size of the rest of the bladder. It apparently had no connexion with the fistula. There were moderate internal hæmorrhoids. The right kidney is an acute surgical kidney with areas of suppuration in the cortex, the left kidney shows more or less chronic inflammation.

Aorta with luetic aneurysm in the descending arch. An old sac-

culation about 2-3 cm. across and an old slit with rounded, thickened edges, quite old. Evidently there has been a false aneurysmal sac. There was some suspicion of aneurysm, clinically, but the patient died suddenly one morning when he had been in apparently good health. At autopsy it was found that this false aneurysmal sac had ruptured behind the trachea and stripped up the parietal peritoneum on the right side until there was a mass of blood half filling the right pleural cavity.

Lung abscess in a girl, with apparently no history of tuberculosis and no signs of tuberculosis at autopsy except one or two calcareous glands behind the peritoneum. The abscess involved two-thirds of the upper right lobe. The whole lung was in a condition of acute broncho-pneumonia. The illness covered a period somewhat less than a month, the process apparently being acute with no sign of tuberculosis.

A RADICAL DEPARTURE FROM THE METHODS IN VOGUE IN DIETETICS, IN DIARRHŒA AND INFANTILE DISORDERS.

S. ORTENBERG, M.D., read the paper of the evening.

F. M. FRY, M.D. I would like to thank Dr. Ortenberg for bringing so close to us some of the researches of the old country. I have had the privilege of observing infants in the Montreal Foundling and Sick Baby Hospital for some ten years back and am much interested in this subject. I went to Berlin, in 1905, fully aware of the fact that most teachers believed that most of our difficulty, in fact almost all the difficulty, was in the digestion of the proteids. In Germany all taught that it was fats alone that gave trouble, and they were giving practically one food only and that was butter milk. Their butter milk contained carbohydrates and a lot of sugar and that material was always boiled, that is to say sterilized. But I found that many infants in Dresden had scurvy, and here as in Berlin butter milk was practically the only food used. I went there believing that all the difficulty lay in the proteids; I was told that all the difficulty lay in the fats. It therefore is intensely interesting for me to-night to hear that all the difficulty is in the sugar. The Germans have switched in four or five years from the fat theory to the sugar theory, and it is a little difficult, I confess for me to bring into agreement that the sugar is at fault and that nature puts over 7 per cent. of sugar in woman's milk.

J. D. MORGAN, M.D. I am interested to know whether this milk is the natural butter milk or that obtained as the result of the addition of the so-called butter milk tablets. I ask this because in the past year so many samples of these tablets, especially of German make, have reach-

ed me, that a possible relationship has occurred to my mind between the extensive German use of butter milk and the large variety of different tablets they put up for its manufacture. I presume, however, that the butter milk mentioned by Dr. Ortenberg is of the natural kind as he mentions the almost complete absence of fat which would not be the case were the butter milk obtained by the addition of the tablets to the total milk. Another point which interested me was in connexion with the experimental work. Dr. Ortenberg mentioned at least one case in which experimental intoxication was produced with fatal results. I presume the infant must have been in a state of health before this work was commenced or else the results would hardly seem perfectly clear, and it just struck me that at this period, when so much talk is going on with regard to experimental work on animals, it would be interesting to know how many such cases of experimental disease are produced in these infants and what the percentage of fatal results, merely as a comparison with the mortality among animals. While such experiments cannot be carried out to any extent on this side of the water it seemed to me a rather interesting point to note the difference of public opinion, in Germany and in America especially, towards experimental work.

H.L. PAVEY, M.D. I have always looked on the summer diarrhoeas of infants as some disturbance of digestion probably due to the food the child was receiving, but I was never able to understand why a perfectly healthy breast fed infant should suddenly take on all the symptoms of intoxication, and I always worked on these cases rather in the dark and my treatment was something along these lines—that carbohydrates and sugars did not agree and the first thing was starvation, and I found in my very small experience that I got best results by starvation and then using weak meat broths until I got the children into fair condition, after which I gave diluted milk, gradually increasing the strength of the same as the condition would permit.

WESLEY MILLS, M.D. I do not know much about the treatment of infants, but it seems to me that in such a subject as digestion one must bear in mind certain broad relationships, and I have been, from my observations of other people and especially of myself, convinced that the fundamental principles to which Dr. Ortenberg has referred are illustrated in adults also. Now, when you consider the relation of digestion to the blood and of the blood to the tissues, something which the books never make quite clear, but which I have always tried to bring out in my teaching, it has always been, a necessity, to my thinking, to connect the metabolism and the blood and lymph and digestion of the food together. In the first place, before Pawlow's discoveries were announced

I had noticed, like other observers, that one's digestion depended not only on the food, and one's general health, but on certain surroundings. One who had been used to certain surroundings suffered under others.

Pawlow illustrated this experimentally, but I think it is a great pity and we require the warning these days, to depend wholly on the laboratory. We should go out into nature and also look in upon ourselves. I have long also noticed in myself that abstinence or almost total abstinence from food for a meal is very beneficial not only to digestion but to the whole body. If I have a difficult task I starve on it, I do not eat much then. We cannot have the necessary energy for digestion and for the other work of the body too. These lower processes cannot go on well if we are expending mental energy, that is, they do not progress well with all men, and I happen to be one of those men. I do not digest carbohydrates and especially sugars well. If I want to be in my best form for mental effort, I confine myself to some bread crust and some broiled beef steak. Now, if I should take carbo-hydrates on that evening I would know it, there would be greater effort required to perform that particular task. When I went to see Berlin first I walked around considerably and I found that I could take an extra quantity of sugar to advantage and also could drink beer which does not agree with me under ordinary circumstances. In other words, there is a relation between the metabolism and the digestion. I believe that if we applied this principle in dealing with the question of the quantity of food and also its quality we would often avert trouble. Just now we are probably inclined to attribute too much to toxins generated in the alimentary canal. They probably do play a part, but one must remember that if the blood is withdrawn to an excessive degree into the splanchnic region it cannot be well distributed over the rest of the body, and the reverse; to a perfect man physically that may be a slight matter, but there are very few perfect men, and when a human being departs from this normal perfect condition such principles as Dr. Ortenberg tells us Professor Finklestein is advocating, seem to apply. I have some experience with butter milk which ordinarily I never care for in cold weather, though I find it a stomach tonic in very warm weather, and last year when I had an acute infective cystitis and there were toxins locally produced, with some fever, I for weeks lived very largely on butter milk. Then there came a time when I did not want any more. Here there was a relation between these toxins and the whole of the metabolism. I found that there came with this a cry for more air. I never kept my windows open so much as after that infective process began. I found that dogs did not like butter milk in cold weather, but that they were very fond of it in very warm weather. Now, the laboratory in these cases is really rather furnishing

a means of investigation than a solution of the problem, if it be a solution. These are among the general principles that one must consider in all these cases. We are a very complicated organism, and we may make a mistake in keeping too much to one aspect of a subject in investigating it, and we constantly have to guard against too narrow and restricted (however accurate), a view of things. It is by keeping in mind these general physiological relations and studying them in oneself that one will come to the laboratory in the right state of mind. It is to be borne in mind that the laboratory can be at best a means to an end;—that the interpretation and application of its results must come through general experience.

S. ORTENBERG, M.D. With regard to the remarks of Dr. Fry, that the Germans have from time to time changed around in their theories and beliefs as to the cause of this condition in infants, this might be said in reply. Finklestein does not deny that it is possible to produce an indigestion through injudicious and excessive feeding of albumin. What he refutes is that the albumin, next to the bacteria, is *the* etiological factor in the causation of Summer Complaint. In reply to Dr. Morgan, the butter milk employed in Finklestein's Institute is natural butter milk. As to whether the public in Germany do not raise any strong objections to the experimental investigations being carried out on children, it may be remarked, in the first place, that this work is done in an institution controlled by the State. The Government has implicit trust and confidence in the medical and research staff, and gives them a liberal scope. Furthermore, very little of this work is permitted to reach the ears of the general public; and what does leak out is soon passed over quietly. For, the German lay public—unlike the British—is educated to respect, in the full sense of the word, scientific research-work, and especially so that connected with Medicine.

W. GRANT STEWART, M.D. This is a most interesting paper, and the discussion has been most instructive. We are very grateful to Dr. Ortenberg for bringing this before us and we must congratulate him, and we hope to hear from him again of his work, particularly along this line. I asked a lady superintendent of one of the large homes for babies, in this city, with regard to this infant feeding, a woman who had been at the institute for many years and one of great common sense. She found that ordinary milk partially diluted with barley water seemed to agree better with most children than any other kind of food. We find men, like Boudin, of Paris, feeding new born babies with almost pure milk, we have Rotch and Holt's method of modifying milk, and it is hard to say what is the best, the only thing is to study the individual child and treat as an individual case.

The fourteenth regular meeting of the Society was held Friday evening, the 15th April, Dr. W. Grant Stewart, president, in the Chair.

LIVING CASE: CHRONIC SINUSITIS.

E. HAMILTON WHITE, M.D. My object in bringing this patient before you to-night is to show the result of a radical operation in this condition. There is considerable prejudice against this operation on account of the belief that it necessarily involves marked deformity. Of these cases of chronic sinusitis some can be treated conservatively with satisfactory results, but a considerable number of them require a radical operation to avoid a prolonged persistent course.

In this case, a young man, 21 years old, the complaint was of nasal obstruction for years. He has been under conservative treatment elsewhere for the last five years, having had nasal polypi removed at intervals of about three or four months: during this period there had been more or less constant muco-purulent discharge and other symptoms, such as headache, and general depression in varying degrees; with an acute cold there would be an exacerbation of the symptoms.

After investigating the case thoroughly it was found that the polypi were symptomatic of sinus suppuration and that practically all the sinuses were involved, more so on the right side. Dr. Birkett kindly saw the case with me and agreed that some radical operation was necessary in view of the prolonged history and persistent recurrence of the nasal polypi.

I operated on the 31st of January, and a modified Kilian operation was done. A Luc-Caldwell operation on the antrum was done at the same time, the antrum being found the seat of extensive polypoidal degeneration. The most serious portion of the operation is, of course, in the ethmoidal region which requires a thorough cleaning out to ensure the success of the operation. In this case the frontal sinus was not very large, and therefore I thought we could deal with it sufficiently well and so carried out the removal of the anterior wall, which is the deforming part of the operation. The convalescence was uneventful. He was 12 days in the hospital, during which period nothing of any consequence occurred.

The radical operation has two important features, first, a very radical cleaning of the sinuses, and in the second place (and this is always the most important point) to leave the wound in such a condition that there is permanent free drainage in all the cavities. This is accompanied by the removal of the ethmoid region and the lower portion of the middle turbinate.

The wound was closed by primary suture and a small gauze drain left

in. In removing the gauze there was a slight secondary hæmorrhage and the resulting clots blocked the drainage temporarily and caused some œdema around the wound, but this soon subsided.

The skiagraph shows the diseased condition present, the clouding of both antra is plainly seen, and there is also a marked difference of the ethmoids on the two sides. The second skiagraph was taken after operation and one can easily see the extent of the bone operation. Most of the anterior wall of the antrum was removed in dealing with that cavity, while the frontal sinus and the ethmoidal region were reached by removal of the internal angular process of the frontal bone and the nasal process of the superior maxilla. As one can see, the resulting scar is barely noticeable and there is no deformity of the forehead.

J. ALEX. HUTCHISON, M.D. I should like to express a word of pleasure at having the opportunity of seeing this case. It certainly seems a good surgical proceeding, and the cicatrix on the face is certainly an excellent result.

W. GRANT STEWART, M.D. I saw this patient in the hospital, and those who now have the opportunity of seeing how very little scarring there is on the face will appreciate the results of this operation.

CARCINOMA OF THE SPLENIC FLEXURE OF COLON, WITH SPECIMEN.

J. ALEX. HUTCHISON, M.D., and S. B. WOLBACH, M.D. This case is of not very unusual interest, but the history is peculiar. The patient was a female, aged 60 years, mother of 13 children, who had been complaining for about six months of more or less abdominal pain, pretty general, particularly in the upper zone of the abdomen. I saw her at her home and recommended removal to the hospital for observation. There was some constipation, lasting over six months; no vomiting, and no very severe pain, although there was fairly continuous slight colicky pain. On admission to the hospital she was a thin, anæmic woman, somewhat dull, with a fairly prominent abdomen which was slightly tense and tympanitic, though no mass or induration was made out, and no evidence of contractile movements of the small bowel such as are seen in ileus. She was kept under observation for a week or two. She had no movement of the bowels for a week before admission, but under enema the bowels freely opened; distension disappeared, and most of the pain. However, in a few days, as there still remained some pain of a colicky character, I recommended an exploration. On opening the abdomen in the median line above the umbilicus what struck one at once was that the patient had been the subject of a very extensive general peritonitis; adhesions were in all directions, the small bowel, the omentum, the colon, but no evidence of obstruction was found, except in the small bowel there

was a well-formed band made up of tissue which had evidently been there for some time. In the pelvis there were many adhesions, and in the left upper zone there was a marked inflammatory mass binding everything down so that one could not recognize the parts.. The descending colon was firmly fixed, as also was the transverse colon. I suspected that there was some growth in the colon, perhaps at the splenic flexure, but there was no obstruction in the large bowel and there was the partial obstruction in the small bowel. I limited myself to the loosening of this obstruction. She returned home to her family with a diagnosis that another operation would have to be performed later on. I had no opportunity of bringing the transverse colon to the descending colon, if one had wanted to make an anastomosis, so that if obstruction had taken place it would have called for a transplantation of the small bowel into the descending colon. She was warned about her diet, but she partook freely of some solid food on one occasion, and which was followed by severe pain and vomiting, for which condition she was re-admitted to hospital where she died a few hours later.

S. B. WOLBACH, M.D. A word or two of explanation will suffice. The transverse colon was adherent to the sigmoid and the first part of the descending colon was adherent to the kidney. The ulceration is exactly at the splenic flexure where the bowel is most sharply bent and surrounding that part of the intestine was a fair sized abscess cavity in contact with the wall of the colon, the kidney and spleen, so that it was rather difficult to remove the specimen. The spleen is still attached.

EXPERIMENTAL INTRA-THORACIC SURGERY—DIFFERENTIAL METHODS. EXHIBITION OF POSITIVE PRESSURE APPARATUS.

E. M. VON EBERTS, M.D.

E. W. ARCHIBALD, M.D. (See page 508.)

J. M. ELDER, M.D. I have been very much interested, indeed, in this paper to-night, and quite agree with what Dr. Archibald has said that not only the Society, but the whole surgical fraternity in Montreal, are very much indebted to Dr. von Eberts and those who have been associated with him in this series of experiments. The subject is a very wide one, and, as Dr. von Eberts has said, these experiments are at their beginning, but we have all been deeply interested in watching the experiments leading to the more safe performance of thoracic operations. Dr. von Eberts has talked of pneumonectomy; this is only one of the numerous uses to which the method can be applied. Operations upon the heart, upon the œsophagus, any trans-thoracic region, the thoracic duct, any operation necessitating the opening of both sides of the thorax and the keeping up of the supply of air to the lung. Dr. Archibald has just hinted at another method, namely, the question of passing the tube down

into the trachea and forcing air in that way. I would like to ask if Dr. von Eberts has made any experiments along this line. It has been lately found that instead of using air, oxygen may be introduced. I would like to say here that this method of aspiration of the pneumo-thorax is, of course, nothing new; it has been known to general surgeons for a long time. I am sure it is sixteen years ago since I presented a case before this Society in which this was done.

Every one knows the very grave danger there is in accidental pneumothorax in operating, and we are particularly to be congratulated upon the fact that this beginning for an even safety has been made here in Montreal. Another point is the difficulty in giving an anæsthetic by the ordinary method. This will have to be remedied by giving the anæsthetic in some other way, not depending upon the air absorption from the lung. It seems to me that what Dr. Archibald has said is true, that the apparatus used by Willy-Meyer appears to be the type of apparatus of the future. Of course the type arranged by Robinson is far too cumbersome for ordinary use. The man who gives the ether is in a cabinet under the plus pressure while the patient is kept under the negative pressure. It occurred to me that a negative pressure chamber, such as the oxygen apparatus used by those who go into mines, might be considered.

G. E. ARMSTRONG, M.D. I should like to congratulate Dr. von Eberts, Dr. Archibald and Dr. Hill, for the very interesting subject they have brought before us. I have no experience in this work, but from reading the subject as it has appeared in the journals, I am inclined to agree with Dr. Archibald that up to the present our best results are obtained by the negative and positive pressure apparatus so arranged that one can easily change from one to the other. The three things that strike the general surgeon are, first the enormous field of usefulness that may be opened up by this work. We have all felt the great limitations in getting access to the thorax for many reasons and many purposes. Two great difficulties present themselves, however, and one is the difficulty in occupying the space from which the lung has been removed. This has often been done experimentally, but, when one attempts the same operations in the human, one finds that the conditions are essentially different. In animal experimentation a normal thorax is opened, the lung tissue, mediastinum, and great vessels and the heart are normal, elastic and more or less movable. In the human we do not operate under these conditions. We would like to operate in conditions where repair has failed, the elasticity of the lung materially impaired and bound down by

a thickened inelastic plura, where the mediastinum is fixed and the heart and great vessels held in an abnormal position by firm adhesions.

Another great difficulty is that of getting quick and safe union, for example, in the œsophagus after resection of a malignant growth. Abdominal surgery is possible because we get union of peritoneal surfaces immediately. They unite while we look at them, and that union is air tight and water tight and serves until a firmer union of the connective tissue takes place. In the thorax, for instance, in the resection of the œsophagus we have no peritoneal covering. It is quite possible to bring the stomach up through the diaphragm and remove the growth from the œsophagus and fix the ends together by sutures. Can we maintain this apposition in the absence of the peritoneal investment until union takes place?

These are some of the many difficulties which present themselves, and which offer a most inviting field to the investigator. There is little doubt that these difficulties will be overcome, and I wish our present investigators every success in their efforts to extend the field of surgery in this direction.

MAUDE E. ABBOTT, M.D. Apart from the value of the investigation I would like to mention the fact that experiments such as these provide most valuable sets of specimens; several of these sets are now in the museum.

E. M. VON EBERTS, M.D. With regard to Meltzer's method, it, of course, necessitates tracheotomy or peroral intubation. If lung inflation can be maintained without tracheotomy, manifestly it should be done, as it always complicates matters very much. In this method the essential is that the tube passed down near to the bifurcation should allow room for the return flow of air, and the opening in the trachea should be large enough for the admission not only of the supply of air or oxygen, but for the free escape of the air returning. While in this method of Meltzer it is true that the air enters and returns by the same route, provision is made in the size of the tube for the free escape about it. This is simply a repetition of a very old physiological experiment in the pigeon, where the lung was maintained in a distended state through the passage of a current of air through the humerus of the pigeon which connects directly with the respiratory viscera. So that Meltzer's method, although the intake and outlet are by the same tube, is founded on an old physiological experiment. None of our experiments were carried out with the aid of tracheotomy. Thoracotomies were performed without differential pressure. With regard to the anæsthetic there is no doubt that the removal of a large amount of lung removes a certain amount of ab-

sorbing surface, but in doing pneumonectomies upon rabbits, very little anaesthetic is required after the thorax is opened. With regard to the application of the combined method of Meyer, I think the development of intra-thoracic surgery depends primarily upon the invention of some cheap and simple apparatus. The ordinary negative pressure chamber requires an outlay of \$1,000 and an expert to look after it. Meyer's combined method is even a more costly affair and requires the care of a special assistant.

With regard to the prospects of developing a satisfactory technique for oesophageal suture, I think that once a safe approach is established a method of establishing a rapid and safe anastomosis in cases of stricture of the lower end of the oesophagus will be developed in time; that, however, is one of the least favourable propositions.

The specimens I have here will show the effect of aspiration. The first specimen is of a rabbit with right lung removed. On examination you will see that the cavity has been completely obliterated; the heart and pericardium occupy the upper zone of the thorax. The diaphragm has risen to obliterate that portion of the pleural cavity which is occupied by the wedge of the lung posteriorly; between the two is the displaced and enlarged butterfly lobe; on the other side is the normal left lung. In the other specimen (frozen sections) one can trace the eviscerated cavity.

PATHOLOGICAL SPECIMENS.

S. B. WOLBACH, M.D. The first specimen is a branched Meckel's diverticulum, the intestine has been inflated; the next is a specimen from Dr. Armstrong's service from a patient with general peritonitis, and is an enterolith in an inflamed and perforated Meckel's diverticulum. No. 3 illustrates the effect of injection after delivery in the 7th or 8th month of pregnancy. The uterus shows the placental site deeply ulcerated, a necrotic cervix; and an abscess of the corpus luteum which is not common. Here is a lung from an elderly person who had chronic myocarditis and chronic nephritis. The lung is interesting, because it shows marked emphysema and emphysematous bullae of unusual size. The next preparation is from Dr. Finley's service, a case of malignant endocarditis with a mycotic aneurysm of the ascending aorta. At autopsy, there was found also a purulent pericarditis, and in the smears from that preparation there were Gram-negative diplococci which were intracellular and identical in appearance with the gonococcus. We did not obtain cultures from this case, not having on hand a large enough quantity of the medium. The patient had been treated one month before admission for gonorrhoea. Unfortunately, we did not have sufficient

history during the life of the patient to prove this case as one due to the gonococcus. To compare, I have this heart of another case of malignant aortic endocarditis from a man of about 25 years with mitral stenosis. It is simply a routine specimen and also shows two rather good infarcts in the spleen.

The next specimen is in some respects one of great rarity. A very extensive prolapse of the rectum, apparently a more recent prolapse upon a chronic prolapse. The cause of death was rupture of the sigmoid flexure. The abdomen was found filled with hardened and molded feces at the autopsy.

The last preparation is one about which there is some slight doubt as to the ultimate pathological diagnosis. It is a case of jaundice of comparatively short duration in a subject with alcoholic and syphilitic history. Post mortem revealed a liver weighing 905 grammes of very lax consistency and which on section showed mottling with red and yellow portions predominating. The gross appearance is that of acute yellow atrophy. A crude section showed very extensive destruction of liver tissue. I am not yet able to state positively that it is a case of acute yellow atrophy: at least it is one of a very acute destruction of the liver substance. The aorta shows a thickening and wrinkling of the arch and thoracic portion which is probably syphilitic in origin.

F. G. FINLEY, M.D. With reference to this case, the man was admitted to the hospital in a condition of delirium, with a deep jaundice, a normal temperature and a liver which I just felt on the first day. Later it was very greatly decreased. He passed into a condition of coma and died. During life, we thought the condition might be one of cirrhosis although the absence of splenic enlargement was against this. He had had syphilis, and it is possible that the acute yellow atrophy was due to this cause. A second case was recently in the hospital with heart disease in which the liver was enlarged, and which developed delirium and jaundice late in the disease, and Dr. Wolbach reported very marked atrophy of the liver. In this patient there was also evidence of syphilis, post mortem, in the aorta.

E. W. ARCHIBALD, M.D. I had the privilege and pleasure of assisting Dr. von Eberts in a number of his experiments, and I must congratulate him very heartily upon the very excellent piece of research work he has done, which I hope is still only in its beginnings. There remain a very large number of questions of interest to the surgeon and to the pathologist alike in experimental lung work, and I hope that here, in Montreal, the solution of a number of these problems will be accomplished. Coming particularly to questions of detail, one might say a great deal upon various aspects of the subject, but time will permit of

but two or three points which I would like to bring out. First, in performing removal of parts of the lung or the whole of one lung in dogs, one of the chief difficulties has been found to be that after closure of the soft parts the vacant space was not immediately filled up by bulging of the mediastinum, uprising of the diaphragm, and falling in of the thoracic walls, but that gradually, within a few days, there occurred a large transudate into the cavity which caused the death of the animal from the third to the fifth day. I believe that Dr. von Eberts was the first, working at that time upon rabbits, to adopt the principle of inducing negative pressure at the close of the operation after having performed part of the operation under positive pressure. He was the first to employ aspiration of the chest to remove the pressure after closing the thoracic wall. Although Dr. Robinson has come to use this procedure, Dr. von Eberts employed it last fall. In this way the transudate is very much less likely to occur; in other words, the mediastinum is given time, under more normal conditions, to accommodate itself to the vacant space, and the space is gradually filled up to a very large extent, without much transudate or with none at all. The time has certainly come when, in Montreal, we must be prepared to do exploratory thoracotomies, if necessary, on both sides of the chest. Of course, we have done this on one side when we were sure that the other side was in good condition; but there are cases in advanced surgery in which a double operation is indicated. This work indicates a beginning in this line in Montreal. There are other applications of differential pressure in ordinary clinical work, such as certain points in the treatment of empyema, removal of tumours of the thoracic wall, exploring of the lung itself for abscess, and possibly for removal of tumours and excision of a lobe of the lung for chronic bronchiectasis—there are numerous processes like these which can be very much better treated if one had such an apparatus perfected. I might call attention to Meltzer and Auer's article in a late number of the New York Medical Record, in which they advise the method of continuous intra-tracheal insufflation. This does very well in laboratory animals. Elsberg has proposed a more elaborate apparatus in the human, by which the insufflated air is supplied by a motor-driven pump. The theory is, that this can distend the lung at about half its normal excursion, and that the lung can be kept in this state without respiratory movement at all. If this can be proven to be applicable with safety to the human, it will have the advantage over the positive and negative apparatuses that it can be used by the average surgeon with safety and economy. The question is a very wide one, and I think the Society is to be congratulated in having this extremely scientific series of experiments placed before it.