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# QUEEN'S MEDICAL QUARTERLY.

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VOL. XI, No. 3  
Old Series

APRIL, 1907.

VOL. IV, No. 3  
New Series.

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QUEEN'S MEDICAL QUARTERLY is presented to the Medical Profession with the compliments of Queen's Medical Faculty. Contributions will be gladly received from members of the Profession and willingly published.

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BUSINESS MANAGER: W. T. CONNELL, M.D.

This number is issued under the supervision of  
Dr. W. T. Connell.

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THE corner stone of the new Medical Laboratories building was laid by His Honor William Mortimer Clark, Esq., K.C., Lieutenant-Governor of Ontario, at the close of Convocation on April 24th. As may be surmised from this, the contracts for the construction of the building have been concluded. Under the terms of these, it will be possible to move into the new building during the next Christmas vacation. Our friends and graduates will join with the faculty in a lively satisfaction at the progress made, and at the prospect of improved and enlarged accommodation for students and professors.

Very careful deliberation by the building committee has resulted in extremely favorable contracts, and it is fully expected that the grant of \$50,000 will be sufficient to complete the building in every particular.

It is fortunate, indeed, for the future of medical education in this province, that the government has adopted the policy of state aid and has not in any narrow way limited its responsibility to the medical school in connection with the Provincial University. Efficiency in medical education cannot be maintained by students' fees alone.

A great step in advance was taken when the Royal College of Physicians and Surgeons became a Faculty of Queen's University, under a constitution, which removed all semblance of

proprietary interest, and yet safeguarded academic and financial independence from Senate and Trustees Board. The wisdom of the late Principal Grant has become more evident, as the years have passed away. During the past year an equally important advance was made in securing recognition from the Provincial Government of our right to participate in public funds available for the improvement of medical education.

As to maintenance and the furtherance of research work, the government already makes a small grant for the laboratory, in which work is done for the Provincial Board of Health. As soon as the building is completed, we expect the government will make the necessary provision for the proper maintenance and development of the work of the school, so far as it relates to public health and sanitation.

In the meantime we are also soliciting from our friends money to endow the chair of anatomy, and we have no doubt that the day will come when all the departments taught by men, devoting all their time to University work, will be supported by the government, or adequately endowed.

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### ANNUAL CONVOCATION, 1907.

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**F**OR the first time in ten years the Medical Faculty joined with the other Faculties in Annual Convocation. Heretofore the medical lectures and examinations were completed from two to three weeks before those of other Faculties, but, owing to the prolongation of the medical course, the Convocations were again joined. Convocation was held on the afternoon of April 24th in Grant Hall. Long before 2:30 o'clock, the time set for the opening, the auditorium was filled, and only a few seats were vacant in the gallery.

The chancellor, Sir Sandford Fleming, presided, and Rev. D. R. Drummond, M.A., of Hamilton, was chaplain.

The unveiling of the brass tablet, over the rear of the platform, erected through the instrumentality of Sir Sandford

Fleming, to commemorate the work of the graduates and students in erecting Grant Hall, then took place, the honor falling upon Hon. Justice Maclellan, chairman of the university board of trustees.

Before unveiling the tablet, Justice Maclellan made a short address, in which he referred to the great calamity which befell the university in 1912, in the death of Principal Grant. He then went into the details, regarding the erection of the tablet.

The conferring of degrees and the awarding of prizes was afterwards proceeded with in the usual way, the proceedings being kept very lively at certain intervals by the singing of the college songs by the students in the galleries.

The medical graduates were presented by Dean Connell to the Chancellor for laureation, and the prizes were presented to the successful candidates by the various professors. A list of the graduates and prize winners will be found elsewhere in this issue.

Prof. Goodwin presented to the chancellor for the honorary degree of doctor of laws, Prof. Willet G. Miller, geologist of the Ontario government.

"The duty which devolves upon me is at the same time a pleasant and an easy one," said Prof. Goodwin. "It is hardly necessary to introduce to you, sir, or indeed to those assembled here in convocation, one, who is well known in Kingston. Prof. Miller is one of a group of four or five men, who, fourteen years ago, undertook to carry on a school of mining here. His scholarly attainments, and his intuitive insight into what was best to lay before his students, soon made him a powerful force in those early days of struggle against odds. Seven years he served as our colleague, and then celebrated his jubilee by entering the service of the province of Ontario. He has just completed a second jubilee period, which you are asked to mark by conferring on him the degree of doctor of laws. But, before you thus honor Queen's University in honoring Prof. Miller, permit me, sir, to say a very few words.

"Some of us have tried, generally with poor success, to keep up with Prof. Miller on the trail, or where there was no trail; we have sat with him around the camp fire, we have

discussed with him the deeper mysteries of life, as well as the more obvious things of literature and science; we have observed him as he met all sorts and conditions of men; and we have found him ring true to every test of a strong, straight, scholarly man. In his own subject he is at least as well known as any man in America.

"Prof. Miller has inaugurated in Canada an era of economic geology which, I venture to predict, will for all time be associated with his name. His reports for the bureau of mines have attracted world-wide attention. Canada has had no better advertisement. Years before the Temiskaming and Northern Ontario Railway was projected, Prof. Miller had his eye on that northern country. He suggested Haileybury and New Liskeard as useful points for summer mining classes, and subsequent events in that wonderful region must have been less of surprise for Prof. Miller than for any other man in Canada.

"During the past two or three years we have seen our former colleague tried in another way, and his administrative ability has been the chief factor in preserving for the province and for Canadians a great deal of the wealth which has been so suddenly brought to light.

"As a writer Prof. Miller has shown himself equally strong. Taking a Sunday walk along the track of the Temiskaming and Northern Ontario Railway, last June, I overtook two young prospectors who read in a book as they walked along. 'Strange to find such earnest Bible students in this wild country', thought I. When I got near them I saw that the book was 'Minerals', by Prof. W. G. Miller—then and ever since the 'prospectors' Bible'."

In reply Prof. Miller said in part:

"I am very proud to receive this honor from Queen's University. It comes with appropriateness, because of the good work now being done by the University in the department of geology and mining. Queen's was the last of the three universities—the others being McGill and Toronto to establish a department of practical science, which began as a school of mining fourteen years ago. And it is a remarkable fact that the graduating class in mining this year is the largest in Canada. This is a very suitable place for a school of

mining, and for the study of geology. On the Barriefield commons there is an epitome of the whole geology of the earth, and Eastern Ontario affords a greater variety of minerals than is to be found in any other part of Canada. There are also working mines not far from the city. While here this week I have had interviews with a considerable number of the graduates, and I hope to secure some of them for work in Northern Ontario. I have found them very suitable in physique and in command of their subjects, but, unfortunately, I have not been able to secure as many of them as I desired.

“Queen’s has in the past been remarkable for her course in philosophy and literature. Some people seem to think that these are not practical subjects, but my experience is different. We have three towns in Northern Ontario, New Liskeard, Haileybury and Cobalt, and the Presbyterian clergymen in these three places are graduates of Queen’s, and the fact that they have been so successful in their congregations speaks well for them. Queen’s graduates appear to have hit the mark”.

After referring to some other matters, Prof. Miller complimented the Chancellor on the marked success of the University and resumed his seat amidst loud applause.

#### ADDRESS TO GRADUATES.

An address from Principal Gordon followed. He said that the convocation proceedings of this year had a special feature, in the presence of his honor, Lieut.-Gov. Clark, and the University was delighted to welcome him. His honor had stated that he would only be able to speak once, and this was at the laying of the corner stone of the medical laboratories’ building.

Principal Gordon, in continuing, said that he hoped that at the opening of the next term the University would have the pleasure of welcoming back the graduates who would enter to qualify for high school teachers.

The Principal paid a high tribute to the two retiring professors, Prof. Ferguson and Prof. Fowler. Although these gentlemen were retiring, he hoped that the University would be honored with their presence at other convocations. Prof. Ferguson had been connected with the University for thirty-eight years, and Prof. Fowler twenty-seven years.

The number enrolled at the University this year was 1,134, an increase of ninety-seven over that of the previous year. He did not wish to lay great stress on the number, but it was pleasing to note that Queen's was furnishing the education that was desired. For the graduates leaving he would say that the one thing that strengthened their course at Queen's was the spirit of loyal devotion to the truth. The vague ideas of the students upon entering the University were pictured. A great vastness of truth had been opened before them. He would urge the graduates to always remember the loyal spirit of truth in the search for knowledge.

In his concluding remarks Principal Gordon congratulated the graduates, and asked them to keep in touch with the University, which would ever be ready to rejoice with them in their future success.

Rev. D. R. Drummond followed with prayer, and the Convocation proceedings of 1907 were brought to a close by the singing of the national anthem.

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## CEREMONY OF LAYING THE CORNER STONE OF MEDICAL LABORATORIES' BUILDING.

The corner stone of the medical laboratories building at Queen's University was laid by the Lieutenant-Governor of Ontario immediately after the Convocation ceremonies in Grant Hall April 24th. Over a thousand spectators gathered around the foundation of the new building, which is rapidly rising into space. On the temporarily constructed platform, which was adorned with bunting, flags and flowers, were the Lieutenant-Governor, Sir Sandford Fleming, Principal Gordon, Dean Connell, members of the University Faculties and trustees, J. S. Willison, LL.D., of the Toronto News, and a number of ladies and press representatives. After the invocation prayer by Principal Gordon, Dean Connell spoke as follows :

## DEAN CONNELL'S ADDRESS.

“In the olden days of Aesculapius and Hippocrates a medical school was a very simple affair, consisting of a professor, a student and a grove of trees. For thousands of years conditions almost as primitive as these surrounded medical education, and during all this period little or no progress was made in the art and science of medicine. It is only in our day that medicine has come to its own and seeks to erect its altars within temples specially designed and dedicated to the mysteries of its art. Within the past twenty-five years the well-known wonderful development of medicine has had its origin in laboratories attached to medical schools and hospitals. In these and in the processes by which results have been achieved the public has taken little interest, though it has already enjoyed untold benefits.

“It is the duty and the business of this as of other medical schools to give to the public the best educated practitioners in every department of medicine, and so to increase our knowledge as to render the profession constantly more and more efficient, but it is equally the duty of the public to provide the needed facilities for making it possible to obtain the best men for the prosecution of original research so that the school may render its best service to the community.

“It must now be admitted that the fees paid by medical students can never again be sufficient to maintain a medical school in a high degree of efficiency. For many years, here as elsewhere, the medical student has paid his way with fees enormously greater than those of arts, science, divinity or law, for whose benefit endowments, scholarships and government grants have been always available. Yet the medical graduate is surely of as much value as the graduate in science.

“Happily, in this province, the government now recognizes its duty, and during the last three years money has been voted for the improvement of medical education. A year ago the sum of \$50,000 was granted to the medical faculty of Queen's University for this purpose, and the greatest need being for laboratories, it was decided to erect this medical laboratories building.



"We are thankful for the enlarged opportunities which will come to our professors and students, and we congratulate the community upon the material advantages certain to arise from the work carried on within its walls.

"On behalf of the faculty of medicine, Mr. Chancellor, I beg that you request his honor the lieutenant-governor to lay the corner stone and to use this trowel for the purpose."

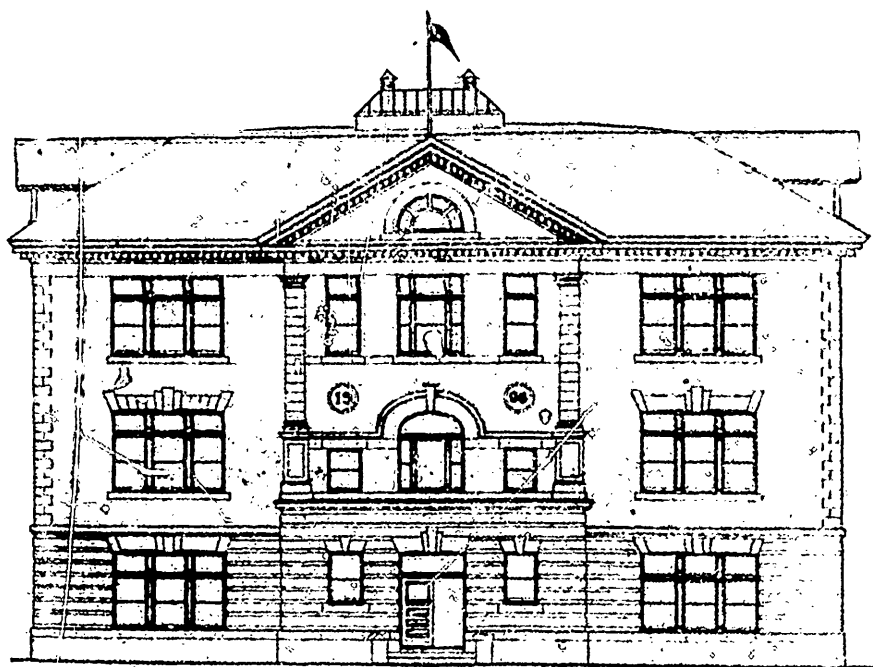
Sir Sandford Fleming then presented the lieutenant-governor with a handsome silver trowel, and his honor proceeded to the corner stone, which was soon set in position and declared by him well and truly laid. Upon this stone was this inscription: "This stone was laid by William Mortimer Clark, lieutenant-governor of Ontario, April 24th, 1907."

#### LIEUT.-GOVERNOR'S REPLY.

The lieutenant-governor was then escorted to the front of the platform, from which he addressed the large crowd of spectators. In opening he stated that he considered it a great honor to have his name connected with the laying of the corner-stone of the laboratories building. He would always look back with pleasure upon the present occasion, and the trowel which had been presented to him he would ever keep with pride to hand down to his family.

He had, since his early manhood, taken a deep interest in the profession of medical science. This interest had commenced when he was a student in Edinburgh studying law over 50 years ago. He was at this time connected with a firm which conducted the business of the Royal College of Surgeons, and he reminded his hearers that at this time the college was but recently separated from the wealthy corporation of the barber-chirurgeons. It was one of his duties during this time, extending over a period of three years, to attend all the oral examinations conducted by the college, and thus he overheard this portion of the examinations.

One of the things that had impressed him at that time in connection with the profession was its somewhat indefinite knowledge of the causes and cures for disease, and he confessed that on this account he had still a vague apprehension. However, one cannot but be impressed by the progress in the



MEDICAL LABORATORIES BUILDING

medical science within the last fifty years, the last quarter century being especially fruitful in this regard. Diseases which had for many years baffled the medical profession had now been overcome, and it afforded him much pleasure to see that Queen's University was always looking in the direction of further improvements. He sincerely trusted that the investigations pursued here would lead to still further advances in the science, meaning as it did an amelioration of human sufferings.

"I take this opportunity of congratulating this University upon its phenomenal progress", continued the speaker. "I do not know of another university in the Dominion of Canada which has made so marked progress, with so little to do it with. It has been marvellous the way Queen's has prospered. I am glad to see that the government has at last awakened, and noticed the efforts being put forth by Queen's.

"There is one thing about the University that we all must admire, and that is the warm devotion of its graduates to their Alma Mater. I congratulate the Principal for everything that has been accomplished, and I also congratulate the Professors and everyone associated with the institution.

"There is one thing that I do hope will be secured, and that is better remuneration for the faculty. The cost of living, as we all know, has increased, but the salaries have not been increased. This should be looked after, and the increases made".

His honor said that he was glad of the opportunity to speak on such an occasion. He would always look back with great pleasure to the event.

"Whenever I hear the name of Queen's mentioned", he said, "I will always think of this day and what it means to you. You are to-day taking another step in advancement, and I again congratulate you".

Hearty applause followed the address of the governor. The proceedings concluded with cheers for his honor and the king.

## THREE CASES OF EXTRA UTERINE PREGNANCY.

### CASE 1.—EXTRA UTERINE PREGNANCY—PYOSALPINX—SMALL MULTILOCLAR OVARIAN CYST—SUBINVOLUTION OF UTERUS.

Mrs. E. C. Francis, Sask., Unipara.—Was called on March 15th, 1905, to see patient who lived 12 miles from town for vomiting which had persisted for two days. Patient said she thought she was over two months pregnant. The abdominal muscles were tender from retching, but she complained of no pain in stomach.

On vaginal examination the uterus was thought to be enlarged and the cervix presented a deep bilateral laceration. She complained of pain in right side of cervix and pelvis on pressure. Uterus appeared to be bound down on that side by adhesions; while on the left side a fluctuating tumor could be felt on pressure to rise well out of the pelvis, appearing above and well out even with the line joining the iliac crests. I placed patient on usual uterine sedatives, but the vomiting persisted. Nothing could be retained by mouth. I tried rectal feeding and administration of sedatives. The enemata were retained well but with no effect on vomiting, which still continued. In consultation with Dr. Kemp the morning of 17th March we decided that the uterus should be emptied and a laparotomy done to remove what we believed to be either an ovarian cyst or a probable ectopic gestation sac. Consent to operation was secured, and I append Dr. Kemp's account of operation as performed by him.

“On external examination the uterus was enlarged to the size of a 3 mos. pregnancy, and a tumor could be felt on the left side.

Under anaesthesia the uterus was explored with the finger and found empty. This exploration was easy, as there was a deep laceration of cervix. The uterus was curetted, as the condition was believed to be due to chronic metritis and subinvolution. The abdomen was opened at once and we found a large pus tube on the right side. On the left side the tumor proved to be made up of an extra uterine pregnancy occupying

a sac made up of the fimbriated extremity of the tube adherent to the ovary and a six sac multilocular cyst. The pus tube on the right side was removed and the ovary on that side spared. The fimbriated extremity of the left tube dissected off with as little destruction of the fimbriæ as possible, and the sac, the ovary with cysts removed. The left tube was then tacked across in front of the uterus, bringing it as near the right ovary as possible in the hope that if its ciliae were not destroyed it might grasp an ovum from the right ovary and carry it to the uterus.

A year later I repaired the cervix and a painful scar of the vagina was removed. This gave opportunity for examination of the uterus, which was found to have returned to nearly normal size".

#### CASE II.—EXTRA UTERINE PREGNANCY—INTRAPERITONEAL RUPTURE WITH HAEMATOCELE.

Mrs. J. K., Austrian by birth, aged 30. Multipara. - Admitted into Indian Head Hospital on July 17th, 1906.

*History*—Had three children living, with no trouble during confinements. Previous to present trouble her menstruation had been normal up to two months before when menstruation lasted longer than usual and was accompanied by a great deal of pain; had missed one period since. She was working about house as usual when she was seized by agonizing pain in left side and fainted. She was sent by train to hospital and was seen by me next morning.

On examination the uterus was found pushed forward close behind the pubes. Behind the uterus there was a firm mass with bulging of the posterior fornix. The mass extended laterally across the pelvis, while slight dullness could be elicited above the pubis and also slightly to the left. Temperature 100.2 F. Patient quite exhausted. The condition was diagnosed as haematocele due to rupture of ectopic gestation sac and haemorrhage was believed to have ceased. The patient was kept in bed perfectly quiet. The bowels could not be moved by light enemas or salines. The temperature on the fourth day after admission went to 103. It was decided to open per vaginum and remove the clot.

The patient was prepared for vaginal section and also for laparotomy if this necessity should arise.

The patient was placed in lithotomy position. Perineum retracted by Kelly speculum. Posterior lip of cervix seized by volsellum forceps and held firmly. The first fold of vaginal mucous membrane posterior to cervix was incised by sharp pointed scissors, the index finger of right hand was inserted into opening, then the middle finger, then both fingers separated enlarging the incision about two inches. The index finger was then pushed backward and easily penetrated the peritoneal cavity. Chocolate colored fluid and pieces of blood clot escaped into the vagina. The finger was gently reinserted and large pieces of clot were broken down and removed quite easily. Embedded in the side of one of the clots was a foetus about one inch and a half long. The clot was very foul smelling. The cavity was gently flushed out with sterile water and a "gauze tube" drain inserted to keep the wound open and provide drainage. The head of the bed was also raised. The cavity was flushed out daily with sterile water. On the afternoon of the next day after the operation patient's bowels moved freely. The patient made a good recovery and left in two weeks with incision closed.

#### CASE III—EXTRA UTERINE PREGNANCY—INTRAPERITONEAL RUPTURE WITH HAEMATOCELE—PELVIC ABSCESS.

Mrs. H. P., age 28—Unipara. Admitted to Indian Head Hospital, October 28th, 1906. Present illness came on two weeks before. On the day before admission she was seized by violent pain in right side and was so weak that she had to be lifted into bed and was driven into hospital (some 16 miles) lying on a mattress in a waggon.

On admission patient was in a very weak condition. Complained of fulness in pelvis, retention of urine and constant desire to defecate. Breasts were enlarged slightly and painful. Temperature 100.5.

Patient on examination was very tender over lower abdomen. Dullness was elicited about one inch above pubis and laterally after bladder was evacuated by catheter.

On vaginal examination—the uterus was pushed upwards

and forwards, the cervix being high up and seemed fixed as in a mould. Laterally and behind cervix was a solid mass, which could be readily felt by fingers in rectum, extending high as examining finger was introduced.

A diagnosis was made of haematocele caused by rupture of an ectopic gestation sac. Treatment—Rest in bed, with fluid nourishment. Saline transfusions were given for the first two days after admission, each pint of transfusion containing  $\frac{1}{2}$  drachm Adrenalin solution 1-1000.

The temperature kept going up gradually, and on sixth day after admission had reached  $104^{\circ}$ . I decided to open per vaginum.

The operation was done as in Case II., and it was found that the clot was mostly converted into a very foul pus and debris. A foetus of about 2  $\frac{1}{2}$  months was found by nurse in the dressings that were changed during the night. The cavity was washed out as before, and patient was discharged well in three weeks.

J. V. CONNELL.

Indian Head, Sask.

## OPSONINS.

**I**N these days, when the literature on opsonic therapy is growing so rapidly, showing that already the field of its usefulness has grown very broad, it may be pardonable on my part to review in a brief manner our knowledge as to the nature of opsonins and their practical importance in medicine. The following is in great part an abstract from a lecture delivered to the 3rd and 4th year medical students on Feb. 23rd, 1907.

### I. THE NATURE OF OPSONINS AND THEIR PRACTICAL APPLICATION IN MEDICINE.

The word, opsonin is of Latin origin (opsono—I prepare for eating, I cater to). Therefore the word is especially applic-

able to those substances in the blood serum, which prepare bacterial or other cells for eating by the leucocytes. That they are distinct from the other anti-bodies in the blood—lytic, agglutinating, &c., has been proved beyond a doubt, and the experiments connected therewith need not be enumerated here.

Before the discovery of opsonins, the rôle of phagocytosis in combatting and overcoming an infecting micro-organism received but little attention; we thought only of anti-toxins, lysins, agglutinins, &c., and the possibilities of their increase or decrease in the course of the morbid process, and that the phagocytes played but a subsidiary part, indeed. With the discovery of opsonins, the purpose of the host of leucocytes, rushing to the site of entry of the invading micro-organism becomes very definite, for the opsonins attach themselves to the bacteria, and sensitize and prepare them for ingestion by the leucocytes. The inflammatory phenomenon of the migration of leucocytes to the site of infection is not to be explained by the presence of opsonins in the blood—a deficiency of opsonins for the infecting micro-organism has doubtless preceded the infection; nor is it likely that the amount of opsonins in the blood-serum of the patient has any influence on the number of leucocytes, crowded together at the infected focus. But the presence of opsonins in the blood has a decided effect on phagocytosis. If there were no opsonins in the blood-serum, phagocytosis would be practically nil, as is seen when an emulsion of bacteria and leucocytes washed free of serum, and suspended in normal salt solution are brought together and incubated. But, if we add some serum and incubate, there is at once phagocytosis. Again, if we mix fresh blood-serum, and an emulsion of bacteria in suitable amounts, and allow them to stand for a few minutes, then centrifugalize so that the bacteria are thrown down to the bottom of the tube; then pipette off the supernatant serum and add salt solution to wash away the serum, and centrifugalize and draw off the supernatant fluid;—if we repeat this washing a number of times, until we are satisfied that all the serum has been washed away from the bacteria, and then add salt solution, we have an emulsion, similar to what we had at the beginning of the experiment, only now the bacteria are sensitized. So that if this emulsion is added to a



volume of leucocytes washed free of serum, and suspended in normal salt solution and incubated, we get active phagocytosis; whereas in the case of the unsensitized bacteria, as mentioned above, phagocytosis is nil. Evidently some union occurred, when the bacteria were digested with the blood serum, which could not be broken down when the serum was withdrawn by repeated washings with salt solution—something was added to the bacteria. The added substance is the opsonin.

Thus, with some idea of the nature of opsonins and their relation to phagocytosis, we may next consider their practical importance.

We know that in many cases, though we have all the phenomena of inflammation, which, considering the rôle of the phagocytes as now understood, is a very conservative process, indeed, we do not get the happy termination we expect. We know the leucocytes play their part, by migrating to the site of infection, for their dead bodies are being thrown forth continuously in the discharge. They die in vain, for the amount of opsonins in the blood-serum for the particular infecting micro-organism, is too low to completely sensitize the latter; probably this has been the cause of the infection. And this is the reason, as in the case of recurring boils, that, though we may obtain healing at one point of infection, some other site is inoculated, and we have repetition after repetition of the various steps to suppuration.

Before passing on to a discussion of the therapeutic measures to be adopted in a case like the above, it might be well to discuss the theory of the formation of opsonins. Briefly they may be regarded as the result of the inter-action of the cells of the body with certain molecules (opsogens) in bacteria, red corpuscles and possibly other cells, for which in turn they have a special affinity. In infections which go on rapidly to resolution, we find, generally at the close, (e.g. lobar pneumonia), that the opsonins for the invading micro-organism are invariably increased. Experimentally on animals or man by inoculations, the opsonins for a micro-organism can be markedly increased.

In view of the above, we have the means at our disposal, for the treatment of a case of recurring boils or other chronic microbic infection. We have simply to isolate the infecting

micro-organism, which, in the case of boils, is usually the staphylococcus pyogenes aureus, and, after growing it on agar media for twenty-four hours in the required number of tubes, prepare a vaccine. This is done by floating off the growth with salt solution, emulsifying by shaking for one hour in a shaking apparatus, counting the bacteria per cubic centimetre, killing the micro-organisms by heating at 65° C. for one hour, and diluting to the standard with the prepared diluent. The usual standard is 250 millions of cocci per cubic centimetre, the ordinary dose. The diluent used is .25% lysol in sterile normal salt solution. The vaccine is put up in sterile glass tubes, and sealed by heating with a gas-blower. The tips may be broken off, the amount required for an inoculation withdrawn with a sterile syringe and needle, and the tube resealed.

Though this description of the making of a vaccine is necessarily brief, it requires some time to make one, but a sufficient quantity may be made at one time to treat a case throughout.

With the vaccine prepared, the next step is the inoculation of the patient, but before doing so, it is necessary to make a few tests of the patient's blood-serum to determine the amount of opsonins present. It may vary slightly at different calculations, but in a case of recurring boils will likely be found considerably below the normal. Of the method of calculating the opsonic index, or estimating the amount of opsonins in the blood, I shall speak later on. As I have cited as an example, a case of recurring boils, we may as well continue, and our first inoculation will be made with an ordinary hypodermic syringe or one graduated in cubic centimetres, and we shall inoculate 1 c. c. of the vaccine (standardized at 250 millions of cocci per c. c.)

Following the inoculation, for three or four days, if examination of the blood is made, we shall probably find a diminution in the amount of opsonins. This is the 'negative phase' the stage of decreased resistance. Continuing the blood examination, the amount of opsonins will begin to rise, and then at the end of a week or ten days, we shall probably find that the amount of opsonins has risen much above what it was before the inoculation. This is the 'positive phase.' Following, there

will be a secondary slight fall, the 'reflow,' and it is at this point that the second inoculation should be given.

It is clear, then, that the calculation of the opsonic index is necessary, at least at the beginning of the treatment, to decide the interval at which inoculations should be given, and this is especially important when treating a much more grave infection than boils—tuberculosis. But, though to make a perfect opsonic 'tide' upon a chart, it would be necessary to calculate the opsonic index every day, it is quite sufficient as a guide to estimate the opsonins every three or four days. Afterwards the interval may be lengthened.

In connection with the inoculation of vaccines, the question naturally arises,—'Why doesn't the patient inoculate himself, since he has the micro-organisms with him, and they are flourishing abundantly enough?' If auto-inoculation occurred, it would be sufficient, and the patient would probably recover, always provided the auto-inoculations were sufficient in amount and not excessive. But this auto-inoculation frequently does not occur, as the infection is so localized, that sufficient invasion of the tissues is not permitted to stimulate the production of opsonins, and so in all probability the cure of the infection. The same conditions as in recurring boils obtain in acne, where we find the staphylococcus pyogenes albus usually active, and in the many chronic localized infections, so resistant to ordinary treatment.

A paper by Ross gives a very large list of cases, amenable to opsonic therapy. In this list we find acne; recurring boils; carbuncle; pyogenic sycosis; tuberculosis of joints, bone, glands, and urinary organs; acute gonorrhoea, gleet, and gonorrhoeal arthritis; sinus in empyema due to the *M. Lanceolatus*; and incipient pulmonary phthisis.

I may say in completing this section of the paper, that in the different forms of tuberculosis, of which we have a number of cases under treatment at present, the vaccine used is Koch's New Tuberculin, of which after diluting and heating (to kill the tubercle bacilli present), a dose is given, corresponding to from  $\frac{1}{1000}$ — $\frac{1}{100}$  mg. of the powdered tubercle bacilli. Opsonic calculations are made every three or four days, and the time and amounts of dosage gauged accordingly. There is usually con-

siderable local inflammatory phenomena following the inoculation, but scarcely of sufficient degree as to be classed as objectionable by the patient. We have had no febrile reaction following on inoculation as yet.

In cases of suspected pulmonary phthisis, significant findings may be obtained from the calculation of the tuberculo-opsonic index, which may be of assistance in diagnosis.

## II. THE CALCULATION OF THE OPSONIC INDEX.

The calculation of the opsonic index of a patient's blood for a particular micro-organism is, briefly, the estimation of the degree of phagocytosis occurring *in vitro*, as contrasted with that found when the blood of a normal individual or a mixture of the blood of a number of normal individuals is used. To produce phagocytosis outside the body, we endeavor to supply all the requirements and conditions, which obtain within the body; these are leucocytes, serum, bacteria and heat up to the body temperature. Therefore the first step, in the calculation of the opsonic index, is to collect a sufficient quantity of leucocytes.

They are easily obtainable by pricking one's finger, and allowing the blood to drop in a sterile centrifuge tube, containing a sterilized solution of sodium citrate 1.5%, and sodium chloride .85% in distilled water. This defibrinates the blood. About 10 drops of blood is sufficient to give the requisite number of leucocytes. The solution is now shaken up, centrifugalized for five minutes, the supernatant fluid withdrawn, and sterile normal salt solution added to wash away the serum adhering to the leucocytes. It is again shaken, centrifugalized for five minutes, and the salt solution pipetted off. The thin white layer of leucocytes, resting on the red cells is now pipetted into a separate tube, which is of coarse sterile, and the leucocytes are ready for use. (Some wash the leucocytes two or three times with salt solution, but practically this is unnecessary.)

The next step is to make an emulsion in normal salt solution of the micro-organism, against which we are testing the blood-serum. A 24 hour growth is used, except in tubercle. The required concentration is estimated only after some experi-

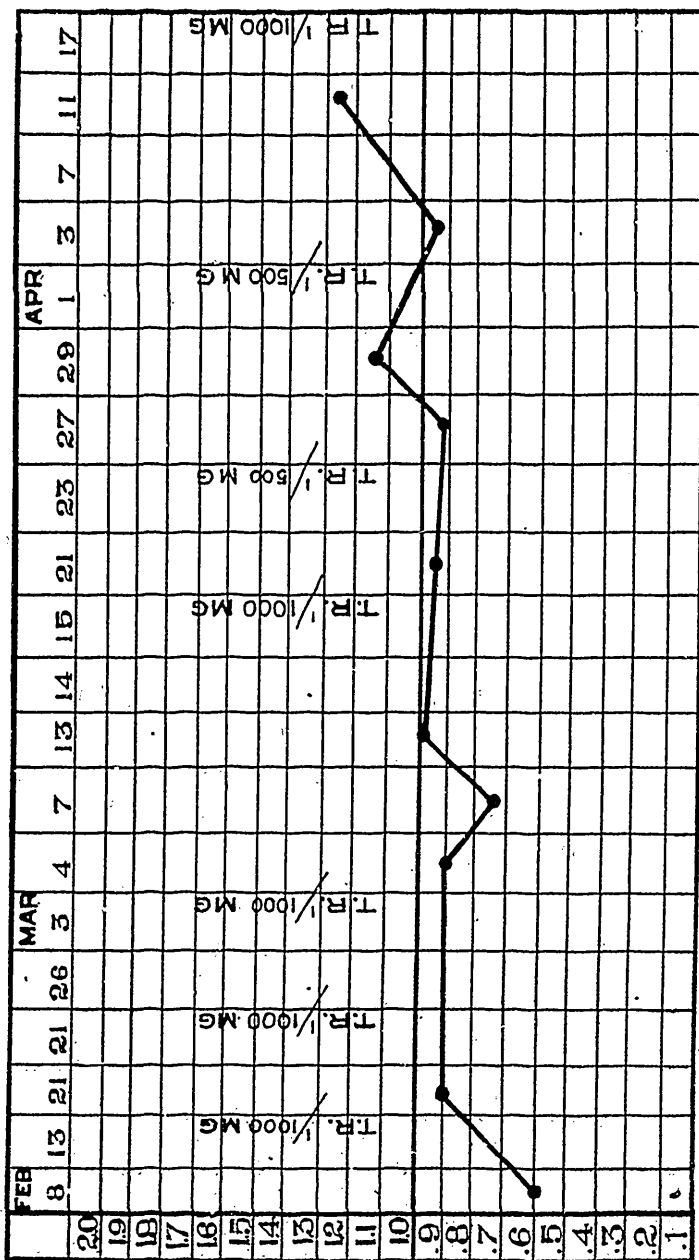
ence; a too-concentrated emulsion would produce a phagocytosis impossible to count, and we should be compelled to repeat the calculation.

We have probably already collected our patient's blood in the small pipette made for that purpose. It is centrifugalized, along with the pipette containing the control. The control blood may, as said before, be of one normal individual or a mixture of the blood of several normal individuals. On taking the pipettes out of the centrifuge, the clear serum will be seen above the clot, and can be readily withdrawn on breaking the pipette just above it.

Now we take two pipettes, one for the control, and one for the patient. With a rubber teat attached to the pipette, we draw up in the pipette to a marked point (arbitrary), a column of leucocytes, then let in a bubble of air; then, an equal column of the emulsion, and let in a bubble of air; then, an equal column of the patient's serum. The three are thoroughly mixed by forcing them with the teat up and down through the pipette on a clean slide or watch glass; and then, the end of the pipette is sealed in the flame. The tube is now placed in a thermostat at 37° C. for 15 minutes, for phagocytosis to occur. The same procedure is gone through with the second pipette, using the control serum, and it is placed in the thermostat for 15 minutes. Thus each pipette contains the same leucocytes, and the same emulsion, but different sera, for it is these we are contrasting.

At the end of 15 minutes exactly, each pipette is taken out in turn, the contents re-mixed, and smears made on slides. These are suitably stained, and then we must count the bacteria phagocytosed. Fifty polymorphonuclear neutrophilic leucocytes are counted in each case. Supposing in 50 leucocytes where the patient's serum was used, we found a total of 300 bacteria phagocytosed; then the average per leucocyte would be 6; and in 50 leucocytes where the control serum was used we found 600 bacteria phagocytosed: then the average per leucocyte would be 12. The contrast as to phagocytosis of the patient's serum vs. the control serum is as 6 to 12, and the opsonic index of the patient is  $\frac{6}{12}$  or .5, as of course the normal is 1.

III. OPSONIC CHART. MR. C.— PULMONARY PHTHISIS.  
 (Points marked ● on chart are the points at which opsonic calculations are made.)



The above chart is illustrative of the result to be desired in opsonic therapy—the gradual rise of the opsonic index. It represents about two months' treatment with tuberculin. The patient is still under treatment, his index continues well above the line, and clinically is progressing very satisfactorily.

WM. GIBSON.

## GONORRHŒA AND SOME OF ITS COMPLICATIONS.

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THE action of the gonococcus is by no means confined to the urethra and the mucous surfaces of the female genitalia and of the conjunctiva, but may be met with at times on other mucous surfaces.

One of these surfaces so attacked is the mucosa of the rectum, and the frequency of gonorrhoeal proctitis may be adjudged by the fact that in my four years of practice I have treated three cases of this affection.

The first of these cases was a young Italian who shortly after his arrival in New York, was indecently assaulted by a fellow traveller, with the result that he developed a violent gonorrhoeal proctitis. The other two, I regret to say, were young women, one due to the discharge from an acute vulvitis trickling over the anus, the other apparently the result of a careless use of toilet paper, during a similar affection. The symptoms in all three were similar.

(1) History of gonorrhoeal infection.

(2) Sensation of itching and burning around anus, with reddening of the mucous membrane.

(3) Dull perineal pain, pain during defecation, frequent almost persistent desire to evacuate the rectum.

(4) As the inflammation reached its height, rectal tenesmus, and a purulent discharge streaked with blood.

The irritative symptoms lasted in all about two weeks, there was moderate fever and great restlessness and nervous irritability of the patient.

The treatment I found most satisfactory was, rest and cleanliness, hot sitz baths, bi-daily douches of hot saturated solution of boracic acid, at night, suppositories of aqueous extract of opium and belladonna and salol grains 5, and boracic acid grs. 10, by the mouth three times a day.

I will next refer to a case of what I believe to be gonorrhoeal bronchitis, though admitting the possibility of a mistake as the bacteriology of the case was not fully worked out.

In a New York Hospital a young lady of somewhat doubtful character was suffering from a severe attack of bronchitis, which on the fourth day gave rise to a purulent expector-

ation, slightly streaked with blood. Fearing pneumonia, I stained a specimen of the sputum and examined it under the microscope. To my surprise I discovered numerous crescent shaped cocci nestling within the epithelial cells. Thinking that possibly I had mistaken the micro-coccus lanceolatus for the gonococcus, I rested my eyes for a moment and looked again, then called one of the other House Surgeons to examine it, we both came to the same conclusion, viz. : that the germs were undoubted gonococci. I thought it might be that there was an oral gonorrhoea, but examination of the mouth revealed no appearance of the disease.

I will next refer in some detail to a case of *Puerperal Septicaemia due to Gonorrhoea*.

This complication of gonorrhoeal urethritis, or rather cervicitis, is glanced at so casually in most text books that the history of a case may be of interest to some.

Mrs. W., age 23 years, primipara, pregnancy normal, urine normal, nothing of interest in the history excepting a leucorrhoea to which she attached a little importance, and to which I unfortunately attached as little. Confined March 25th, 1905, presentation L. O. A., labor pains strong, patient hysterical, after five hours gave chloroform and delivered, no trouble in application of the instruments or in delivery, slight perineal tear— $\frac{1}{2}$  inch—placenta expelled by Crede's method apparently intact, no haemorrhage, uterus contracted well.

On second day after delivery patient complained of considerable pain in lower abdomen and uterus was enlarged and very tender, tenderness extending to right of uterus also. Temperature  $100^{\circ}$  F., pulse 90. Toward evening of same day patient had violent chill, lasting about fifteen minutes, temperature rose to  $104^{\circ}$  F., pain in pelvis and abdomen severe, fundus and uterus reached two fingers breadth above umbilicus, whole uterus exceedingly tender. Thinking the uterus was filled with decomposing blood clots, I decided to curette and on the following morning did so, using the blunt curette. I was surprised to find the uterus quite empty, no blood clots or placental remains. When the patient recovered from the anaesthetic, the pain was more severe than before. Hot water bottles were applied over the painful area without giving any relief, in fact,



the heat seemed to augment the pain. Ten grains of calomel were then given, and two ice bags applied in place of the heat; the calomel relieved the bowels and the ice relieved the pain, but the fever remained still high. I then commenced intrauterine douches of creolin thrice daily, and continued with these and the cold applications for three days, the chills recurred daily, with the fever high, 104° F. with remissions to 99° F. in morning. I now decided that some stronger antiseptic was necessary and changed the douche to bichloride 1-5000. There were no further chills and the fever gradually subsided to normal eight days after delivery. The first three days the lochia was scant, pink in color, on the fourth day it became purulent.

On the tenth day patient complained of severe pain in right labia, temperature rose to 100° F. ; on inspection labia was found to be reddened and swollen, on palpation there was fluctuation. I incised and found an abscess of Bartholin's gland. I now suspected gonorrhoea as the causative factor in the septicaemia. On examining the pus microscopically I found large numbers of gonococci. It was then that I questioned the patient carefully with regard to the leucorrhoea of which we had taken so little notice in the history and found that she had had all the symptoms of an acute gonorrhoea, some months previously.

One thing which struck me as being quite remarkable in connection with this case was the fact that the husband had never had an attack of gonorrhoea but admitted that he had had intercourse with other women, whom he knew had been suffering from this disease ; and that on at least one occasion he had returned home and had intercourse with his own wife, who some days later gave all the symptoms of an acute gonorrhoea. This apparent immunity of the husband I shall refer to again in a few moments.

To recapitulate : the *symptoms of Puerperal Gonorrhoeal Endometritis* as observed in this case :

- (1) Severe continuous pain in and about the uterus.
- (2) Onset with a marked chill, and daily recurrence of same.

(3) High fever in evening with remissions to 99° F. in morning.

(4) Headache and constipation.

(5) Diminution in quantity of lochia with change to pale pink color first three days, then to purulent, and finally to muco-purulent discharge.

(6) Enlargement and marked tenderness of the uterus.

This case has taught me to question carefully all pregnant women what regard to what they consider a simple leucorrhoea and also confirms in my mind the teaching I received not to curette an acutely inflamed uterus. It has also confirmed me in my opinion that bichloride is a better local antiseptic for such cases than creolin and has brought forward again the fact that ice often gives relief to inflammatory pain where heat fails, and vice-versa.

As to the mode of infection by the husband carrying the gonococcus from an infected woman to his wife without himself contracting the disease, I am quite prepared to accept this as highly probably from the evidence in this case.

Next considering coincident syphilitic and gonorrhoeal infections I have only one case to report, though I presume some of the older physicians here have run across a number of instances of this combination. A young man whom I had been treating for an acute gonorrhoea for three weeks developed a chancre. I questioned him carefully; and, as he is a young man whose word may be depended upon, I am satisfied that his statement that he acquired the two diseases at the one time is correct. The syphilitic rash had developed before he was entirely cured of his gonorrhoea.

#### IS THERE AN IMMUNITY TO GONORRHOEA?

This seems to be a rather difficult question to answer. I think in a limited sense we may say there is, as for example the case of the man to whom I referred a few moments ago who had frequently cohabited with women who were so affected and yet had never developed the disease; and I might cite two or three more similar cases. Again, men who have been infected by intercourse, and who have been cured, are apparently not so liable to infection from the same source. In other words, the

urethra seems to have developed a tolerance for that particular species of gonococcus. Many men who cohabit with wives who suffer from an uncured gonorrhoea when once affected and cured, seldom become infected the second time. Whether this seeming immunity consists in a modified virulence of the infecting organism, or whether there is an antitoxine developed or a high opsonic index to the gonococcus, I am not prepared to say. Possibly those individuals who bear charmed lives and never become infected may simply have a strong protective, epithelial lining to the urethral canal.

#### IS GONORRHOEA CURABLE?

I suppose the majority of medical men at the present time would answer unhesitatingly in the affirmative, and in a sense I suppose I must agree with them, gonorrhoeal ophthalmia, for instance, but if we refer to any and every form of gonorrhoeal inflammation, urethritis, cystitis, endometritis, endocervicitis, etc., I must say that I am inclined to think that gonorrhoea is often incurable. It is true that the disease subsides into a subacute or chronic process which gives the patient little or no discomfort and which often outwardly appears cured, but I believe that it very often is merely a slumbering volcano which is liable to break forth again whenever there is sufficient irritation to awaken the sleeping germ.

Personally, I have never seen a case of gonorrhoeal urethritis absolutely cured. During four years experience I have treated over fifty cases of gonorrhoeal urethritis and I cannot say that I have seen one of them completely cured, it is true they are all free of symptoms and there are no apparent signs of the disease, but in every case where the urine was examined months, or even years, after treatment small gonorrhoeal shreds were to be found in greater or less numbers and several cases, after months of apparent cure had a recurrence of the old trouble which they mistook for a fresh attack. In what way did these subsequent attacks differ from the original and why do I consider them as recurrences? Because the onset and course of the disease was quite different from the acute attacks. It came on gradually, usually without pain, the discharge was muco-purulent and was checked in from three days to one week with ordinary treatment. These recurrent attacks were

the result of some heavy debauch or excessive venery. One case I thought completely cured; for two years after treatment he showed no symptoms, and I could find no clap shreds in the urine, but about this time he developed a suppurative inguinal adenitis without any apparent cause—no specific history—I removed these glands, but, two months afterward the other groin became similarly affected, necessitating another operation; I found no gonococci, or tubercle bacilli in the glands. I concluded that this trouble was originated by an old uncured prostatic urethritis. For one year after this, patient was apparently well, but during the last month without any further acute trouble, he has developed irritation at the neck of the bladder causing frequent urination.

In two cases I have examined the mucous shreds found in urine, one six months after cure—so called—the other three months after and in both cases found a few gonococci of poor staining quality.

It is rather hard to have to admit one's inability to cure a disease which other medical men claim they can cure, but I must admit that as far as my experience with gonorrhoeal urethritis is concerned, I have found it in the true sense incurable.

Some may infer from this statement that I have not been treating the disease in a scientific manner. To this I can only say that I have done the best that I could in the light of our present teaching. Balsam of copaiba and its allies I consider harmful in the early stages, useful in the second stage, and useless in the third stage. Alkalis seem to be useful in early and second stages. Strong injections and irrigations which cause actual pain, I consider harmful in all stages. When the early irritative symptoms have subsided somewhat, I usually employ mild irrigations of potassium permanganate in normal saline solution, when all irritative symptoms have subsided, but discharge is purulent, I use a solution of the same chemical, strength 1-3000 daily, and internal medication consisting of balsam copaiba combined with alkalis, when the discharge has ceased and all that remains are the mucous shreds in the urine, I use instillations of silver nitrate thrice a week 1-5000, and internal antiseptics—salol grs. 5, boracic acid grs. 10 t. i. d.

I have not had satisfactory results from protargol or argyrol in urethritis, although I consider argyrol invaluable in gonorrhoeal ophthalmia or conjunctivitis.

After dismissing patient from office treatment, I generally prescribe an injection of bichloride of mercury, grs.  $\frac{1}{2}$ , acid carbolic gtt. 20, zinc sulphocarbolate drams  $\frac{1}{2}$ , boroglyceride (25%) ounces 2, and water to eight ounces, to be used once daily for at least two weeks. The course of treatment lasts six weeks to two months, as a general rule, and the patient is then usually in that condition which we have been accustomed to term "cured."

Strong injections or irrigations, it seems to me, always tend to weaken the resisting power of the urethral mucous membrane and in some cases actually do severe damage; causing haemorrhage, or even stricture. I had two cases of violent haemorrhage follow an instillation of silver nitrate 1-2000. While in one case, almost cured, it brought about a severe recurrence of the acute trouble.

I feel satisfied that we shall get just as satisfactory results from mild irrigations, and conduce materially to the comfort of our patient and his subsequent cure (so called) thereby, than by bold drastic measures which, even to this day, are advocated by some surgeons.

F. M. BELL.  
Ottawa.

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## COLLEGE NEWS.

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EXTRACTS FROM THE ANNUAL REPORT, MEDICAL FACULTY,  
1907.

*To the Board of Trustees:*

On behalf of the Medical Faculty I have to report that the 53rd Session has been successful and the work done of a higher standard than ever before. The registration was 210.

The auditor's report is submitted herewith.

For the first time the Science Research Scholarship has been awarded to a medical student for original work done in the department of Bacteriology. Mr. Campbell Laidlaw, who holds it, will proceed to London to continue his studies. This marked a distinct advance and is an earnest of the work which may be done in the new laboratories.

On the fourth of July last a fire damaged the Medical Building and its contents to the extent of several thousand dollars. A satisfactory settlement was made with the insurance companies and the building was repaired and new apparatus procured from England before the beginning of the session in September. A balance stands to the credit of this fire-loss account to be used for further repairs during the summer. The most serious loss was in the library, but we have already replaced most of the books destroyed. Certain alterations have been made in the building to enlarge the facilities for teaching practical anatomy, and it is intended to further remodel the building at an early date. Last fall the furnace was removed from the building and the heating done from the central plant. This has proved to be very expensive and very much beyond the estimates. The accounts for the installation were 50% over the estimates of Prof. Gill.

The insurance upon the medical building and its contents has been increased to \$25,000, of which \$5,000 is held by the Trustees. At the time of the fire last summer it was found that \$5,000 of the \$10,000 held by the Trustees had been discontinued without the Faculty being informed of the fact.

In May of last year the Ontario Government granted the sum of \$50,000 to the Medical Faculty "for the promotion of medical education". Thereupon the Faculty decided to erect a building to contain laboratories for those subjects of the medical course requiring such accommodation. With this in view certain proposals were made to the Trustees at their special meeting in June last and these were agreed upon. Contracts have been made for the construction of the building, and it is expected that it will be ready for occupation by the first of January next. This will give adequate accommodation for the laboratory subjects for some time to come. By agreement the building is to be in control of the Medical Faculty, but one half of

it is designed for the department of Biology, which includes Physiology and Histology under Dr. Knight. As this department is financed by the Trustees it will be necessary for them to provide for one half of the maintenance of the building.

The working of the department of Anatomy under Dr. Etherington has been most satisfactory, and he is now recommended to your Board for appointment as Professor of Human Anatomy. The Faculty trusts that it may be possible to also separate his work in Comparative Anatomy from that of Biology, as recommended in the report of Dr. Knight. The maintenance of the whole department will be undertaken by the Faculty if the Trustees will assign for this purpose the graduation fees of medical students (less graduation expenses) and, of course, the fees paid by arts students taking the class. The balance will be made up by the Faculty out of expense account. So far very little money has been secured for the endowment of a chair in Anatomy.

There has been for a long time dissatisfaction with the course of Chemistry as taught to medical students. The Faculty has therefore in consideration the reorganization of the course upon a basis independent of the School of Mining.

J. C. CONNELL, Dean.

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It is with very great regret that we announce the resignation of the Secretary-Treasurer, after a period of service extending over three and a half years. Under Dr. Connell's efficient management the College has been carried on in a most satisfactory manner. The duties have gradually become more and more onerous, and at the same time the work of Dr. Connell's own department has enormously increased. When, a few weeks ago, the Ontario Government asked him to assume the duties of pathologist to Rockwood Asylum, it was felt to be necessary to relieve him of some other work. The Faculty, therefore, reluctantly accepted his resignation of the Secretaryship. Dr. Connell has made a record in prompt, correct and wise conduct of all the business entrusted to him, and he has retained or perhaps increased his popularity with the students. Dr. Etherington, Professor of Anatomy, has been appointed to succeed him.

J.C.C.

We desire to congratulate Dr. Campbell Laidlaw, B.A., of this year's graduating class, on securing the Exhibition of 1851 Science Research Scholarship. This scholarship is worth \$750 per year, and is tenable for two years. Candidates must have shown a capacity for research work, this being best evidenced by the production of such work. Dr. Laidlaw carried on a research in the Bacteriological Laboratory on the classification and characters of a bacterium secured some years ago from "Rusty-spot" cheese by Dr. W. T. Connell, and proved by him to be the cause of this condition. A condition of the scholarship is that the candidate holding it must devote his time to research work along industrial or scientific lines. Dr. Laidlaw leaves shortly for London, Eng., where it is his intention to take up the study of opsonins, more especially in connection with tuberculosis. We wish him success in his work. This is the first instance of this scholarship being held by a graduate of medicine, and we trust in future that candidates will be available from this Faculty.

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That a busy practitioner may still find time to extend his reading beyond the subjects of medicine has been exemplified in the case of Dr. Foley, of Westport, who as an extra-mural student at the recent examinations was successful in completing the work for the B.A. degree, and is now entitled to append these letters to his name.

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Dr. G. W. Mylks sailed early in April for England, where he will spend four months in the London hospitals.

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#### THE FIRE IN MCGILL MEDICAL BUILDING.

It is with much regret that we heard of the disastrous fire in the Medical Building at McGill on the morning of April 16th. Following so soon after the destruction of the Engineering Building, this fire has indeed struck another severe blow to the University. While the building is not completely destroyed, no part entirely escaped damage by fire and water or both. The central portion, the upper two storeys of the front part and the upper story of the rear part are practically destroyed. The lower story of the front part, including the



library and stock room and the front room of the pathological museum have escaped, though there will be some damage from water and smoke. The anatomical and pathological departments have been completely destroyed, including the anatomical museum and about two-thirds of the magnificent pathological museum. The physiological, histological and hygienic laboratories in the rear wing have been least damaged, though all have suffered. The loss to some individual members of the Faculty has also been heavy. Dr. Shepherd loses his fine collection of specimens, slides, etc., the fruit of many years labor. Prof. Adami loses his private working library, a loss that money alone can never repair.

The buildings will be at once repaired and so far as possible be put into shape for the opening of next session. Certainly now is the time for the friends of McGill to rally to her aid, and we trust they will not be found wanting in this time of trial.

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### Medical Examinations—April, 1907.

#### DEGREE OF M.D. AND C.M.

Asselstine, B. ....	Wilton.
Bennett, A. E. H. ....	Vancouver, B.C
Bowen, H. M. ....	Gananoque.
Boyce, H. A. ....	Murray.
Brown, J. E. ....	Kingston, Jamaica.
Burke, M. L. ....	Port Antonio, Jamaica.
Casselmann, S. B. ....	North Williamsburg.
Curphey, A. G. ....	Kingston, Jamaica.
Donevan, F. J. ....	Gananoque.
Greaves, G. A. ....	Kingston.
Johnston, A. C. ....	Kingston.
Kean, S. G. ....	Brookfield, Nfld.
Keeley, F. J. ....	Railton.
Laidlaw, C., B.A. ....	Georgetown.
Longmore, H. B., B.A. ....	Camden East.
Mills, R. M. ....	Kingston.
McCormick, A. M. ....	Ottawa.
McDonald, A. ....	Scotch Line.
McDougald, W. L. ....	Cornwall.
McNamara, J. P. ....	Stratford.

Paul, R. D. ....	Selby.
Quigley, J. P., M.A. ....	Kingston.
Scott, R. A., B.A. ....	Walkerton.
Spankie, A. T. ....	Wolfe Island.
Spence, H. D. L., B.A. ....	Kingston.
Story, G. E. ....	Evarts, Alta.
Sullivan, J. H. ....	Peterborough.
Trousdale, F. H. ....	Hartington.
Walker, M. J. O. ....	Kingston.
Wightman, R. ....	Lancaster.

MEDALS AND PRIZES.

FACULTY PRIZES IN ANATOMY.

- 1st year prize—H. R. Thompson, Morristown, N.Y.  
 2nd year prize—J. B. Hutton, Kingston.

FIRST PRIZE FOR GENERAL PROFICIENCY IN SECOND YEAR, VALUE \$25.  
 J. E. Gelbraith, Arnott.

N. Y. ALUMNI ASSOCIATION SCHOLARSHIP, VALUE \$50.  
 W. G. Wallace, Metcalfe.

MATERIA MEDICA CLASS PRIZE

M. C. MacKinnon, Whim Road Cross, P.E.I.

DEAN FOWLER SCHOLARSHIP FOR GENERAL PROFICIENCY, THIRD YEAR, VALUE \$50.  
 I. D. Cotnam, Pembroke.

PATHOLOGY CLASS PRIZE, THIRD YEAR.

W. O. Usher, M.A., Wicklow.

CHANCELLOR'S SCHOLARSHIP FOR GENERAL PROFICIENCY THROUGHOUT COURSE,  
 VALUE \$70.

J. P. Quigley, M.A., Kingston.

UNIVERSITY MEDAL IN MEDICINE.

H. A. Boyce, Murray.

UNIVERSITY MEDAL IN SURGERY.

J. P. Quigley, M.A., Kingston.

\$25 PRIZE IN MENTAL DISEASES GIVEN BY DR. BARBER.

A. E. H. Bennett, Vancouver, B.C.

RECOMMENDED FOR HOUSE SURGEONIES AT GENERAL HOSPITAL.

R. Wightman, Lancaster; H. A. Boyce, Murray, Ont.; F. H. Trousdale, Hartington. Next in order: J. P. McNamara, Stratford; A. T. Spankie, Wolfe Island; R. D. Paul, Selby; M. J. O. Walker, Kingston; R. M. Mills, Kingston.

CLASS PRIZE FOR PHYSICAL DIAGNOSIS, THIRD YEAR.

F. R. Sargent, Kingston.