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REGENERATION OF THE AXONES OF SPINAL NEURONES
IN MAN.

BY

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Gentlemen,—The subject I have to discuss to-day is regeneration of the axones of the spinal neurones in man. I shall deal with the results of personal observation to a large extent and have considered it expedient to make but few references to the extensive literature bearing upon the subject.

Considerable doubt as to the possibility of regeneration taking place, is widely expressed. Numerous experimenters have operated upon monkeys, dogs and other animals; but so far as I am aware—except in the recent paper by Dr. James Collier in *Brain*, where he states that immediate suture experiments upon the spinal cords of animals have shown that regeneration is possible—have failed to establish the fact that regeneration takes place in the spinal axones.

Sir William Gowers, in his text book on Diseases of the Nervous System, Vol. 1., in discussing transverse myelitis of the cord refers to the possibility of regeneration taking place, and he notes a case where at one time a very considerable destruction of the cord was present with symptoms approaching transverse division, namely, complete motor paraplegia, grave sensory disturbances, increased reflexes, bladder and rectal retention, etc. After many months a fair return of motion and sensation took place, spasticity being a marked feature. After the lapse of years the patient died from some intercurrent ailment. Pathological sections of the cord were obtained at the seat of the myelitis, and in the crossed pyramidal tracts and other areas of the cord were found a number of very minute axones in a situation where normally large nerve fibres are usually seen, and he was of the opinion that those smaller fibres were regenerated axones.

I do not know of any case in the literature in which transverse divis-

ion of the cord in man was known to be complete, where regeneration has been demonstrated histologically and clinically, except in the case I shall discuss later, where complete transverse division of the cord was seen at the operation, and after the lapse of months clinical symptoms of regeneration were present with histological evidences at the post-mortem examination. There have been one or two cases reported as examples of total lesion with persistent knee jerks, but, that the lesion was absolutely complete, admits of doubt.

The supposed reason why regeneration does not take place in the spinal neurones of man, is the absence of the neurolemma sheath in those neurones. It has been established by many workers that the nuclei of the neurolemma sheath is a considerable factor in the regeneration of the peripheral nerves.

Being of the belief that regeneration could occur as shown by Gowers and others, I decided that upon the first opportunity, I should use every means in my power to aid such a case by appropriate treatment, and thereby help to produce regeneration.

In the large majority of cases injury of the cord takes place in the lumbar or lower dorsal segments. The time that would elapse before regeneration took place would be very considerable on account of the injury occurring in that part of the axones so remote from the cell bodies which are the seat of their vital functions. It is a well known fact that in suturing a divided peripheral nerve in the distal end of an extremity, considerably more time elapses before function is re-established than in those cases where the peripheral nerve has been sutured in the proximal part of the extremity, that going to show regeneration takes place quicker when the injury is in close proximity to the cell body.

Why is it, if regeneration does occur, as shown by Gowers, that so few cases improve after serious transverse myelitis, traumatic or otherwise, and that none, as far as I am aware, recovered where transverse division of the cord occurred due to fracture dislocation, and where at the operation complete severance of the cord was detected? Unfortunately many surgeons and neurologists, with serious results, frequently recommend, in cases of fracture dislocation of the spinal column associated with motor and sensory paralysis of the lower extremities, that operative procedure be delayed. In other cases where operation is advised at once the surgeon cuts down and removes the pressure on the cord and if transverse division is present, the prognosis being very serious, the patient is, as a rule, put back to bed and little more is done, with the result that grave secondary changes take place in the muscles, blood vessels and nerves and in that part of the cord below the seat of

pressure or of transverse division. The extremities are allowed to fall by gravity into any position, and thereupon, stretching of certain muscles takes place, which hastens the onward progress of the condition. I have seen quite a number of cases and have read reports of others, where fracture dislocation had occurred and pressed upon the cord, producing motor and sensory paralysis, etc. Operation being performed at once, no damage to the structure could be detected macroscopically, yet the after results were very unsatisfactory.

The reason for this is as follows: If pressure be exerted upon the spinal cord suddenly, and it may be only momentarily, no changes may be detected in the structure by the eye, yet there is no doubt that a marked molecular change occurs in the axones of the spinal neurones inhibiting function,—as shown clinically by the paralysis of motion and sensation in the lower extremities, etc. In cases where the pressure is not momentary, but allowed to continue for a week or ten days and at the operation no alteration in the cord is detected, yet, like the above, the molecular change must be very grave and no doubt greater than the results where pressure is only momentary. Here not only molecular change may be present, but also local anæmia from pressure on the blood vessels, which if long continued will lead to necrotic changes.

The majority of cases of fracture dislocation and pressure on the cord, when brought into the hospital show the symptoms of motor and sensory paralysis with increased reflexes and spastic condition, pointing to a serious involvement of the cord, but not to transverse division, this last being indicated in those cases in which flaccid and sensory paralysis and loss of the reflexes is the symptom complex. An examination of the muscles of the lower extremities, if made at entrance usually show no alteration from normal to electrical stimulation. That is to say, when the lesion has been confined, as it is in the large majority of cases, to the lower dorsal cord, affecting only one or two segments, the lumbar enlargement is free from hæmatomyelia or any such injury as would produce an immediate effect on the lower motor neurone. After a day or so has elapsed in many of those cases, the reflexes are diminished and shortly after this reaction of degeneration becomes typical.

Now we see some cases may pass from a spastic to a flaccid state with abolition of the reflexes and reaction of degeneration, and, in a period varying from a few days to a week, present a typical picture of transverse division of the cord—motor and sensory paralysis, absence of the reflexes, flaccid state of the muscles and typical reaction of degeneration. If operation were carried out at this point, we should probably find on cutting down

to the cord no alteration in structure macroscopically. Pressure being removed, the progress of the case is more frequently downwards than stationary. Why is this so? Pressure has produced molecular changes in the axones preventing stimulation from coming down or going up, with the result that we have isolation alteration or physiological deterioration, due to stimulation not being carried to the cells of the anterior horns below the lesion, with the result that changes such as flaccidity and reaction of degeneration in the muscles occur clinically, as above stated.

The cell bodies of the neurones to carry on their functions must have nourishment as well as stimulation, or they undergo degenerative changes or physiological alterations, and following this, secondary changes take place in the muscles and other structures of the extremities, as they, likewise, require stimulation and must be bathed in a healthy circulation. Now, stimulation and circulation cannot take place if the injury to the cord is as severe as above stated, and it is necessary that proper treatment such as electricity, massage and the prevention of deformity by the use of splints, and of adhesions of the joints by the frequent movement of the limbs should be carried out.

It has been shown by James Collier in cases of transverse division of the cord with a flaccid and sensory paralysis and loss of reflexes, that, by the use of electricity with needle electrodes placed into the muscles or nerves, after a time sufficient tone is produced in the muscles that upon striking the patella a reflex can be obtained. This goes to show very clearly the wonderful effect of electricity in producing tone, the presence of tone being an expression of an approach to normal condition of the structure acted upon.

The order of appearance of motor and sensory paralysis in progressive lesions is practically constant in the large majority of cases as follows: Motor paresis and spasticity, increase of the reflexes, anæsthesia below with local hyperæsthesia, sphincter paralysis, thermoanæsthesia and analgesia, tactile anæsthesia, followed by flaccidity with loss of the deep reflexes, progressive lowering of the faradic excitability, muscular wasting and loss of the sphincter tone. Pain and temperature are always earlier affected, and to a greater extent than sensibility to touch. The sensory loss in the usual cases, such as those involving the lower thoracic region involves the skin in order of the length of the sensory neurones supplying it, the soles of the feet being affected first, then the legs and later the thighs, but when the anæsthesia reaches the trunk it extends upwards in segmental order. When there is recovery the first signs to show themselves are, as a rule, subjective sensory disturbances. These are manifested in some cases first in the feet, while

in others the distention of the bladder during the routine lavage is felt, or the patient becomes conscious of the act of micturition or catheterization. Next in order, slight tone makes its appearance, and this can be shown by tapping the muscle, which contracts. Later on the reflexes appear and become markedly increased and, associated with this, is a prominent spasticity, and faradic and galvanic excitability become normal. Sensibility then returns in the following order: Touch, pain, temperature, and usually the lowest sacral segments are sentient before the others. Voluntary power is last to return, the flexors being earlier affected than the extensors. Sometime after the patient has been able to walk the increased reflexes, spastic condition and Babinski sign are apparent, the latter being invariably the last of all to disappear.

Owing to the kindness of Dr. G. E. Armstrong, the following case came under my observation.

J. C., aged 48 years, a sailor, was brought into the Montreal General Hospital, under Dr. Armstrong's care in the spring of 1902, suffering from fracture dislocation of the spinal column in the region of the ninth and tenth dorsal vertebræ, with symptoms of flaccid paralysis, complete loss of motion and sensation and of the superficial and deep reflexes of the lower extremities and bladder and rectal retention. Twenty-four hours after admittance, Dr. Armstrong cut down over the seat of the fracture and removed the laminae of the ninth and tenth dorsal vertebræ. Upon opening the dura mater a complete severance of the cord was found in this situation, with a gap of fully half an inch in extent between the two ends. On stimulating the anterior roots of the first and second lumbar segments with mild faradic current, with needle electrodes, the patient being only very slightly under the influence of the anaesthetic, contraction took place in the muscles of the leg. Stimulation was then applied to the posterior roots of the same segment and this was also followed by contraction of the muscles.

The above experiment was carried out for the following reasons: Considerable discussion had been going on as to the symptom complex present in cases of transverse division of the cord. Bastian, Brunn and others held the opinion that total transverse division of the cord was always followed by a flaccid paralysis, motor and sensory loss, with permanent abolition of the superficial and deep reflexes; others thought that while flaccid paralysis might occur at first, sooner or later a spastic condition set in. This second view was partly due to the influence of the opinions of many authorities who mistakenly compare the effects of transverse sections in dogs and in the higher apes with the sequence of events in man. Here also, physiologists frequently fail in impressing upon the mind of the student that the physiology of the nervous system

in man and in the higher animals (and even in the higher apes) is not comparable. The student often sees the experiment carried out in those animals; they are printed upon his mind, and when at the bedside he is too apt to apply the physiology of the higher animals to man.

According to this second group of observers, if spasticity did not occur and flaccidity and loss of the reflexes still remained, not only in all probability had a transverse division of the cord occurred, but also a hæmatomyelia or some destructive lesion had taken place in the lumbar segment below the transverse lesion, and thereby injured the lower motor neurones, with the result that a flaccid paralysis was present.

Here in this case I was able to establish the fact that the segments below the division was in a more or less healthy condition, otherwise I could not have obtained a contraction of the muscles to faradic stimulation.

The separation of the cord having been found at the operation, as above stated, no hope of recovery was entertained, the patient was brought back to the ward and placed in bed.

This case, I thought, was a very suitable one to observe whether or not spasticity would develop, and I obtained permission from Dr. Armstrong to carefully observe the patient from time to time and carry out any method of treatment I could suggest. I held it advisable that an energetic and frequent application of faradic and galvanic stimulation be made to the extremities, so as to keep the muscles in as healthy a condition as possible. Fortunately, at this time I had a group of students who had taken a voluntary course in neurology extending over some six weeks, and with whom I had frequently discussed the ætiology of the reflexes and the symptom complex in spinal cord cases. Very little inducement was necessary to obtain relays of students to help me in treating the patient in the hope of arriving at some definite conclusion as to what symptoms are present in a case of this description, where, at the operation we had been able to demonstrate that the cord below the lesion was more or less healthy. Through their willingness I was able to obtain help and carry out treatment that I could not otherwise have done in a ward of a general hospital. Fortunately the patient was an interesting man. He was a sailor by occupation, had a retentive mind and related pleasing anecdotes about the different lands he had visited. He was of a genial disposition and had the ability of pleasing those who took part in his treatment. All the above factors, though seemingly unimportant, had a great deal to do with the results obtained in this case.

Weeks and months passed, but no return of the reflexes or alteration in the flaccid state of the limbs took place. By the treatment carried

out, wonderful results were obtained, inasmuch as singularly few trophic or vaso-motor disturbances appeared in the extremities. Careful washing out of the bladder was attended to and everything was done to keep the patient in as perfect a condition as possible. No vestige of any sensory disturbances, subjective or objective, were at any time mentioned as occurring.

At the end of six months, no alteration taking place, I felt justified in holding to Bastian's opinion, that total transverse division of the cord is followed by permanent flaccid paralysis, sensory loss and abolition of the reflexes. At the operation the lower segment was found uninjured, since stimulation by the battery gave us positive contraction in the muscles. Here, then, by this means, for the first time on record, it was shown that the permanent loss of the knee jerk and the flaccid state are due to the removal of the higher centres, and not to any concomitant injury to, or consecutive structural change in, the lumbo-sacral segments.

Eleven months after the operation, and just about the time that the work of Purves Stuart and Ballance was brought out, stimulating our interest in the regeneration of the peripheral nerves, Dr. Armstrong wished to know whether I could suggest anything in the way of helping our patient. It had been shown that transplantation of the peripheral nerves could be successfully carried out and that even the intervention of foreign substances, such as catgut ligature or similar material placed between the ends of a divided nerve, would help to establish regeneration. Dr. Armstrong asked me whether I thought it would be of any use to transplant a dog's cord between the ends of the divided cord of our patient. My reply was that I did not know what would occur, but did not think any serious results were likely to follow and it might be worthy of a trial. He decided to have this operation carried out. A large dog was obtained, placed under chloroform, and an operation to expose the cord was carefully done under the most strict asepsis by two assistants, Dr. Barlow and Dr. Campbell. While this was being done our patient was put under chloroform and placed on the table. An incision was made over the seat of the old lesion, the dura mater opened and the cord exposed. At this time we found that a separation now existed between the two ends of the cord, about one and a half inch in extent. With a mild faradic current the anterior and posterior roots in the lower segment of the cord were stimulated, and a faint response took place in the muscles. The dog's cord to the extent of three inches was laid alongside the upper and lower segments of the patient's, a few fine stitches united the pia arachnoid of the one to the other, the dura mater was closed, the wound sutured, a plaster jacket applied and

the patient taken back to the ward. He made a perfect recovery from the operation, the temperature on no occasion going over 100.

In the summer of 1903 I had the pleasure of informing Sir Victor Horsely of this operation having been carried out, and the results above mentioned, and he made the flattering remark that he thought Dr. Armstrong had achieved a great triumph in surgery in having carried out this operation without any septic results following; as one is well aware how difficult it is to operate on a dog with perfect aseptic technique.

A month passed without any apparent change. Fortunately I had another group of students who had attended my voluntary Christmas Vacation Course. I was able to instil in them an interest in the case, and was thereby able again to obtain help in giving the electricity and massage that I could not otherwise have done. The fifth week after the operation the patient was conscious of flatus in the lower quadrant of the abdomen. This he had never experienced before. Six days following this he became conscious of the passage of the catheter, when routine lavage of the bladder was being carried out, and ten days later he was able to inform the orderly that his bowels were about to move, and could tell when faecal matter passed the rectum. On this date, for the first time, he complained of subjective sensations of pins and needles in the right foot, and a week later of the same symptoms in the left foot. Two months after the operation he described vividly and with all assurance subjective disturbances in both feet extending up to the knees. The passage of the catheter and the evacuation of the bowels were much more clearly felt.

At first we were inclined to think that this must be purely imagination, but when one heard the patient describe the condition with such exactitude, its coming and going, one began to think otherwise. Another reason for our coming to the belief that those feelings were real was that after the first operation the patient had as much care as after the second, and his desire and hope of recovery was just as keen if not more so than after the second, yet he never by any means gave the suggestion that such symptoms as above described were at any time present. Little alteration, progress or otherwise, from the above was noted until about the eighteenth day after the operation, when it was detected for the first time that with percussion of the pleximeter upon the muscles of the flexor aspect of the thigh and leg, the presence of a certain amount of tone was noticed by the contraction of the muscle. Neither at this time or at any time since the accident had voluntary movement or the return of objective sensory symptoms taken place. The reflexes, superficial and deep were still absent.

Sixteen days after this, for some unaccountable reason, the tempera-

ture ran up to 103°. The chest was normal and the bladder showed no symptoms of cystitis. The urine was carefully examined by the house surgeon, but nothing found pointing to any kidney trouble. From that day the patient began to lose his appetite and failed physically. Everything was done in the way of medicinal treatment, nourishing diet, etc., to keep up his general condition, but he slowly grew weaker and weaker, and finally died in the course of a fortnight. At the post mortem a large abscess was found in the right kidney, and this had been the probable cause of his death. Strange to say, as above mentioned, the urine was examined on two different occasions, after the onset of the fever, by the house doctor, but nothing pointing to any such disturbance was found.

The cord was carefully removed and placed in Muller fluid to harden. Six weeks later I opened up the dura mater and found lying between the two ends of the cord, where the injury had occurred, a diffuent mass. Sections of the cord above and below the lesion were put aside for Pal-Weigert stain, and the dura mater with its adherent mass between the ends of the cord was likewise prepared for Pal-Weigert stain. The sections of the upper segment revealed the typical ascending degenerations in the fields of Goll and Burdach, the direct cerebellar, and Gower's tracts. The sections below showed definite degenerations in the crossed and direct pyramidal tracts. The dura with its adherent substances which lay between the ends of the cord, after being stained by the Pal-Weigert method, showed a mass of minute myelin sheaths of nerve fibres which you may see by looking through the microscope placed before you. These fibres can be seen lying closely adherent to the dura mater and when traced upwards and downwards through the different sections, unite with the segments of the cord above and below, demonstrating the fact that regeneration of the axones of the spinal neurones had taken place, to a limited extent. Pal-Weigert stain, as you know, stains only the myelin sheaths. At the time of the operation the dura mater between the two segments was perfectly clear of nerve fibres to the naked eye.

I do not for a moment suggest that the dog's cord retained its vitality after it had been removed and placed inside the dural sheath, nor would I like to suggest that it was the dog's cord started the regeneration. I only want to speak here of the following facts, which you will see demonstrated under the microscope, that the nerve fibres are present and that they unite the two segments of the cord. Unfortunately, I did not place the cord in formalin or alcohol and, therefore, was unable to make a study of the lower segment by the Nissl method. From the sections you will see that this lower segment is comparatively

speaking, in a fairly healthy condition. Sections through the cauda equina showed very little change, indeed, 90 per cent. of the nerve fibres making up this structure were to all intents and purposes normal by the Pal-Weigert stain.

I had the pleasure of showing the specimens at a meeting of the Lister Club at McGill University, where the pathologists without hesitation assented to the view that regeneration had taken place.

The success in this case, I think, was largely due to the patient having been so assiduously treated by electricity, the prevention of contractures and the frequent movement and massage of the extremities.

Since I have been connected with the Montreal General Hospital quite a few cases of pressure paralysis, without total lesion with motor and sensory paralysis, the result of fracture dislocation of the spinal column, have come under my care, where operation was carried out a very short time after the accident, yet satisfactory results were not obtained. In my opinion this was due largely in some of the cases to the fact that the massage, electricity, etc., were not applied.

In one case only, where I was fortunate in obtaining assistance in carrying out treatment, were good results obtained. This was of a patient of Dr. Kenneth Cameron's, who was brought into the hospital in the summer of 1903, suffering from pressure on the cord, the result of fracture dislocation, with complete flaccid paralysis, loss of the reflexes, grave sensory disturbances and bladder and rectal retention. At the operation Dr. Cameron found a fracture dislocation and displacement of the eleventh and twelfth dorsal laminae with pressure on the cord, the result of the fracture, yet no macroscopical alteration in the structure was detected. The wound was closed up and the patient placed in a plaster jacket. More or less constant electrical treatment was carried out for six months. At the end of that time sensation had partially returned, and this was followed in a couple of months by the return of slight voluntary power. To-day, after a lapse of a year and a half, the patient comes regularly to my clinic for treatment, and is able to walk into the room without the aid of a stick.

The following is a case of Dr. Alexander Blackader's, which he kindly gave me permission to watch. I shall here relate only the essential facts denoting that a marked destructive lesion and probable hæmorrhage had occurred in the region of the fifth, sixth, seventh and eighth cervical segments of the cord on the right side, producing flaccid and atrophic paralysis of the right arm and spastic paralysis of the right leg with sensory symptoms of syringomyelia symptom complex, and the presence of enophthalmos in the right eye and exophthalmos in the left. For two months after entrance to the hos-

pital the patient hung between life and death. At the end of that period he slowly recovered, and in seven months he left the hospital comparatively well. Since that time, two years have elapsed, and, during the interval, he has presented himself for examination, both at my office and at Dr. Blackader's. To-day he is as perfect a type of manhood physically as one could wish to see. He holds a position as locomotive engineer in the Grand Trunk Railway. The photograph, as you see, reveals an absolute symmetry in the muscles of all the extremities, going to show that regeneration of the neurones must have taken place in this case also.

CÆSAREAN SECTION.

BY

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Mr. President and Gentlemen:—It gives me much pleasure to bring before you to-night, the notes of six cases of Cæsarean Section, operated on by me. In order to shorten the report and save repetition, I will briefly describe the operation performed in the six cases. The usual preparatory treatment for laparotomy was followed in each case when there was time for it, and in all cases the abdomen was made as aseptic as possible. The anæsthetic used in each case was alcohol, chloroform and ether. The patient being anæsthetized, an incision was made in the middle line, $2\frac{1}{2}$ inches above the umbilicus and $3\frac{1}{2}$ below. In all cases bleeding was slight, and a ten percent solution of gelatine easily stopped all hemorrhage. The peritoneum was opened. The left flank being well depressed and pressure applied on the right side of the fundus aided by one hand over fundus of uterus, it was brought outside abdominal cavity. It was now covered with hot towels and the intestines were kept in situ by hot towels. Towels were also packed around the uterus to keep any discharge from entering the abdominal cavity. A rubber tube was put around the uterus and drawn well down to the cervix to act as an Esmarch when required. The uterus was then opened from a point between the level of the Fallopian tubes as far down as the contractile ring or 6 inches. The wall of the uterus was cut through rapidly, and the placenta, in five of the cases also, with, in each case, very much less loss of blood than would be lost in an ordinary confinement. The part presenting at the opening was seized and the child delivered rapidly; the cord was clamped with Pean forceps and cut; aseptic ergot was given in the buttock hypodermically and the Esmarch re-

laxed. At once the uterus contracted and little difficulty was experienced in removing placenta and membranes, except in one case. It was then ascertained that the os and cervix were patent for drainage. The uterine wall was closed by interrupted sutures $\frac{1}{4}$ inch apart of No. 4 braided silk. A Lembert was used to bring the peritoneum together and I found that by the time I had put it in the length of the incision the uterus had contracted so much that it was necessary to put in another to keep the peritoneal surfaces together. The peritoneum was then dried out and filled with saline solution. The walls were closed by three layer of sutures, peritoneal by continuous catgut, musculo-aponeurotic by interrupted silk sutures and the skin by interrupted sutures of silk-worm or horsehair. A dry dressing completed the operation. In those cases where it was desired to render the patient sterile the Fallopian tubes were tied in two places and cut between.

Case No. 1, 2,792, Mrs. L., para. 2., aet. 29, Scotch Canadian. Admitted December 22nd, 1902, into Women's Hospital.

Personal history.—Up to 12 months ago presents nothing of note. Menstruation began at 11. In November 1901, she was confined by me of a seven months foetus, by version with a very great deal of difficulty—the child only weighing $4\frac{1}{2}$ pounds. The conjugate of the brim was found then to be diminished. The woman although large and well formed in every other way had only a diameter at most of 9 cm. or $3\frac{1}{2}$ inches.

Family history.—Two sisters died of phthisis. Nothing else of note.

Present condition.—Circulatory and other systems normal. Patient well nourished—134 pounds—good amount of sub-cutaneous fat. Last menstrual period March 26th, 1902. Computed time of gestation 274 days. Patient understanding from last confinement her condition of pelvic deformity desires a living child and to be made sterile. Cæsarean section was proposed and accepted by her. At 3 p.m., December 25th, labor began at 7.45 p.m., and the pains were coming on every 10 minutes. It was decided to perform the operation as soon as possible, which was done as above described, the whole operation taking about one hour and thirty minutes. The child weighed 6 pounds 8 oz. The skin sutures were removed on the 21st day. There was perfect union the whole length of the incision. When the patient was coming to the hospital, she slipped and fell on her left knee and as a result after the operation an effusion appeared in the joint which gave us the only trouble we had, and was not well when she left the hospital. I have seen her Christmas week, 1904, and her baby and herself are and have been in the best of health.

Case No. 2, 2,849. Mrs. H. Para. 1, aet. 24. Admitted to hospital in 1904, in labor.

Personal history.—Last menstruation ended August 7th, 1902. Has been deserted by her husband under cruel conditions which has had an exceedingly bad effect on her both mentally and bodily.

Family history.—Father and brother died from accidents, mother and sisters from childbirth—causes cannot be ascertained.

Present condition.—Respiratory, circulatory and genito-urinary systems normal.

General system.—Height 4 ft. 6 in., weight 89 lbs. Condition emaciated, on examination. Presentation above brim left occipito-anterior position. Heart 156. Child calculated to be about 5 to 5½ lbs. Mensuration shows a justo minor pelvis of male type. Internal conjugate calculated to be about 7 cm. or 2¾ inches. Vagina unusually small. The ischiatic spines seemed to curl inwards and three fingers introduced into the vagina with difficulty, seemed to show only two inches between them. Os uteri admits only one finger. Membranes intact. Labour had been going on for at least 7 hours severely before entering hospital, the pains being at five minute intervals. On consultation it was decided that the only chance for the child and the best for the mother was section. It was explained to her and she consented. Operation was performed without difficulty, and a child 5 lbs 14 oz. was delivered. During the operation the pulse rose to 120, and although she rallied after operation she gradually sank and died from heart failure on the third day. A post mortem showed abdominal conditions to be perfect. It was undoubtedly death from shock acting on an already poor bodily and mental condition. Child was healthy and survived.

Case 3, No. 3,069, Mrs. S., aet. 28, para. 1. Admitted in the 8th month of pregnancy.

General history.—She had mitral and aortic regurgitant murmurs for some years—probably following a severe attack of scarlet fever.

Family history.—Nothing of note.

Present condition.—Genito-urinary system, nil.

Respiratory system.—Great shortness of breath. On examination, chest shows dulness over base of both lungs—on right side being 3½ in., left side 2½ in. and is rapidly increasing, moist rales present in both lungs. Patient unable to breath in recumbent position. Respiration 40 per minute.

Circulatory system.—Mitral and aortic regurgitant murmurs. Area of heart dulness slightly increased. Pulse varies from 120 to 140, weak. Compensation failing rapidly.

General system.—The patient is a healthy looking, well developed woman in appearance, average amount of sub-cutaneous fat. On consultation we felt only one course was open to us, as we had tried every means of supporting the heart and failed, and that was to empty the uterus. As the cervix was very long and only admitted the tip of the index finger and the condition of patient was getting rapidly worse, we considered that the most rapid and least injurious method of relief was section, which was proposed and accepted. Anæsthetic used was pure chloroform alternating with oxygen. Operation was completed entirely in 45 minutes. It was most interesting to notice the prompt and great relief instantly obtained when the uterus was emptied. In this case the most interesting part was the first ten days after operation. It was a continuous and determined fight for life. Oxygen was used in large quantities, adrenalin, strychnine, and all the ordinary and extraordinary heart stimulants. Of all the remedies used beside oxygen, I found that three grains of powdered digitalis leaf given twice daily for four or five doses, produced by far the best effect, bringing down the rate of the pulse and increasing its volume markedly, and patient left the hospital walking down stairs on the 31st day after section. The child was only 8 months in utero and had, I believe, suffered very much from the mother's condition before section. It died on the twenty-third day.

Case 4, No. 3,085. Mrs. W., para. 2, act. 33. Admitted in labour May 22nd, 1904.

As patient was operated on shortly after being admitted to the hospital, history is wanting.

Present condition.—Membranes broke May 18th, at full term she believes. On examination of vulva a mass $2\frac{1}{2}$ in. long and 2 in. in diameter protruded, which was found to be the cervix uteri. On introducing the index finger it measures five inches to the well-marked internal os. No history could be obtained of the condition except that it came on slowly. She had no trouble with her first child. It was clearly a case of hypertrophic elongation of the cervix. As labor was in progress, the pains being ten minutes apart, we considered in consultation that we would not amputate the cervix nor dilate it, and that the only method of delivering patient safely was section, to which patient agreed. The tubes were not tied in this case, as patient was advised to have the operation later, with amputation of the cervix. The placenta was anteriorly implanted, child weighed 5 lbs. 11 oz. Time occupied by the operation 43 minutes. Patient made an uneventful recovery, leaving the hospital at the end of the month. In this case,

although the union of the skin was perfect at first, several silk sutures had to be removed later. The extreme thinness of the skin and the closeness of the silk knot to the surface I feel had something to do with their infection. On their removal the small sinus closed at once. In this case patient nursed her child, and both left the hospital in good condition. The patient was the only one not rendered sterile.

Case No. 5, No. 3,128. Mrs. D. Para. 2., aet. 33. Entered hospital August 11th, 1904, having been intermittently in labor for the past fortnight. Severe pains coming on every other night at 15 minute intervals, but now severe and ten minutes apart.

Personal history.—The only thing worth noting was the fact that her first labor was exceedingly severe. The child weighing 11 lbs., and labor lasted 27 hours. The last three hours she was unconscious from its severity, according to her account.

Family history.—Nil.

Respiratory, genito-urinary and circulatory systems normal.

Present condition. Patient a large, well nourished woman. There are large varicose veins on both legs, about vulva and inside the vulva and on vaginal wall. On examination os uteri dilated about the size of ten cent piece and seemed hard and to be formed of cicatricial tissue. Child calculated to be about eight lbs., and from its size and the local condition, and labor being so long on and no advance made, on consultation the question lay between an accouchement forcé or Cæsarean section. From the local condition of varices and cicatricial os, it was considered that section would be the least dangerous, and the woman desired to be rendered sterile, as she dreaded under these conditions to have children; the husband consenting, section was decided on. After opening the abdomen, the uterus was found to be too large to take out of the opening made, so it was opened in situ, and after the removal of the child the uterus was taken out of the abdomen and the usual procedure followed. The peritoneum was guarded against the discharge of uterus and blood by towels packed about it. Operation took one hour and five minutes. The tubes were tied in two places and cut between. Twenty skin sutures were used and removed on 9th day. Union was by first intention throughout, except at one spot where a deep suture had to be removed. No further trouble occurred. Patient nursed her baby and left the hospital well on the 30th day, able to walk from her room to the cab at the door.

Case No. 6, No. 3,137. Mrs. T., para. 4., aet. 35. Admitted August 25th. 1904.

Family history.—Nil.

Respiratory, circulatory and genito-urinary systems normal.

Personal history. Patient is a small, delicate woman. Her first two confinements were exceedingly difficult forceps cases followed by post-partum hæmorrhage which nearly cost her her life. Last year on the advice of her physician in consultation with a specialist, it was decided that an abortion was called for. She was then $4\frac{1}{2}$ months pregnant; she again nearly died and was a long time convalescing.

Present condition.—She was found to have contracted male pelvis in'ternal conjugate 7.5 cm. (3 inches.) The position by palpation was diagnosed as a breech. Placenta implanted posteriorly child probably a male. Has had irregular pains for a week past. No dilatation of os or cervix. Patient and her husband desire to have section performed and that she be rendered sterile. August 26th, operation performed as described. Placenta found posteriorly; the membranes were so adherent that they were removed with difficulty and a distinct sound like tearing of adhesive plaster from the skin could be heard. After closing the wound a slight hæmorrhage occurred from the uterus, but a hot douche controlled it and there was no further difficulty with the case. Time of operation, one hour and eight minutes. A great deal of the time was taken up in approximating the skin carefully; child, a female, weighed 6 lbs. 4 oz. Biparietal diameter being 9.5 cm.

Such is the history of the six cases. Naturally the question arises what are the indications for this operation? Of late years a change has come over the profession in this special branch, with regard to the expediency of performing section, owing perhaps in a great degree to the good results obtained by modern asepsis. Conditions may be divided into absolute and relative.

Under absolute conditions calling for this operation, the mother and child being in good condition, are tumours which cannot be removed, preventing the descent of the child. Contracted pelves; here we find that almost every author varies somewhat between 7.62 cm. or 3 in. to 9 cm. or $3\frac{1}{2}$ in. In a book it is easy to take what is given as the normal diameter of the child's head and say it should pass through an 8 cm. or even 9 cm. pelvis, but in my opinion one has to consider each case on its merits. To illustrate this; in a New York Maternity Hospital the average for children is $6\frac{1}{2}$ lbs; in Montreal it is from one-sixth to one-third more and it is easy to see that although the head would not have the whole difference in it of weight, it would share proportionately, and make what in New York might possibly be a difficult forceps or version,

an impossible one here. I believe I have now under my care two cases where the child many years ago was delivered through a contracted pelvis with difficulty, and I believe that it injured the children's brains, as they are not quite right mentally in either case. I have always felt convinced that in bringing down a child by force through the brim we bring down considerable tissue at the same time, diminishing the conjugate. Williams, who is very practical, considers that after one hour of strong second stage pains if the head does not engage, section should be considered if mother and child are in good condition and aseptic precautions and a good operator are possible; that it is less likely to damage the mother and child than severe forceps or version. The Roman Catholic Church demands that if possible the child should be saved and this is almost always possible by section. Outside of the indications at the superior strait the bischial diam. of 7 cm. or less may call for section. Placenta prævia when central with an undilated os and long conical cervix, would I believe be the best for woman, certainly for child, and generally for operator. Partial or lateral placenta prævia I think can be treated, as a rule, more easily by the old method; eclampsia gravidarum I do not believe is either an absolute or relative cause for section, as although quickly ending the labour the irritation of the section is more apt to set up convulsions post partum.

As to relative causes, such a case as No. 5 might be considered one. It would doubtless have been possible to deliver her safely, but under the circumstances I think I was justified. When one considers that under proper conditions the death rate of mother and child should be nil, it should not be considered the *dernier ressort* as it too often fatally is for both. Rapidity of operation also is held to be a very important factor towards success.

Much might be said regarding indication, but I have trespassed already too long on your time. I would say in conclusion that I had the hearty co-operation and assistance of Drs. Burnett and Thompson, my House Surgeon and nurses in all my cases which contributed greatly to their success.

An important addition to the doctor's library is promised by a new work on Obstetrics, by Dr. Adam H. Wright, Professor of Obstetrics in Toronto Medical College. It is announced to appear in April from the press of Morang & Co., Toronto.

COMBINED EMPYEMA OF THE LEFT FRONTAL AND ETHMOIDAL CAVITIES.

BY

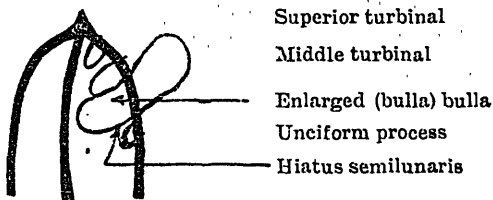
ROBERT H. CRAIG, M.D.,

Laryngologist, Western General Hospital, Montreal.

Mrs. B. C., a woman forty-five years of age, was referred to me by Dr. Spier for examination of the nose and throat.

The patient stated that she was suffering from intense pain in the forehead, localized chiefly over the left frontal region. The present illness began about ten years ago with severe headaches. The pain was very severe and of a neuralgic character and would last for hours, then gradually disappear, leaving a throbbing sensation in the head particularly over the frontal region. When the pain was most severe it was accompanied by attacks of vomiting. The vomiting would continue until the patient was so exhausted that she would fall asleep. The patient states that she was treated by several physicians for neuralgia of the face and head for a period of five years and was then referred to a special hospital clinic in this city where she was examined by an ophthalmic surgeon who stated that the pain was caused by diseased teeth. The teeth in the upper jaw were removed, and the patient experienced considerable relief from pain for one month following extraction. The headaches then recurred with greater intensity, and the pain was becoming so pronounced that she was afraid that she would lose her reason.

Examination revealed a fairly healthy woman. Her cardiac system showed mitral incompetency, no enlargement, compensation good. The other organs so far as could be ascertained were normal. Pressure over the left frontal bone and inner angle of the left eye caused excruciating pain. Examination of the nose disclosed a chronic rhinitis with pus in the left middle meatus, and an enlarged left middle turbinal bone, which was pressed outward by a dilated ethmoidal bulla, as shown roughly in the accompanying diagram.



Examination with electric light was positive both in the left infra-orbital and frontal regions, but negative as regards the antra, which was confirmed by exploratory puncture, after the nose had been thoroughly cleansed. I advised an immediate operation upon the ethmoidal and frontal cavities. The patient readily consented. On the 26th of Janu-

ary, 1904, after anæsthetizing the middle region of the left nostril thoroughly with a ten percent. solution of cocaine, I removed the anterior half of the left middle turbinal, and freely opened the ethmoidal bulla and anterior group of cells. Pus flowed freely. The cavity was curetted and flushed with an antiseptic solution. The bleeding, which was profuse, was controlled from time to time by the application of adrenalin chloride solution. The patient experienced considerable relief after the ethmoidal cells were opened, but, as pain was still present over the frontal cavity, and pus was still present in the middle meatus, I opened the frontal cavity a few days after the above operation. An incision was made in the left interfrontal furrow. The left frontal bone was exposed, and a small button of bone was removed by trephine, midway between the supra-orbital notch and the median line. Pus welled up out of the opening; the cavity was explored and the mucosa was found to be much thickened and covered with unhealthy granulation tissue. I curetted lightly, and washed out the cavity with 1 in 5000 bichloride solution and then swabbed with chloride of zinc, 40 grains to the ounce. Free communication was made into the nose by enlarging and curetting freely the naso-frontal duct. A wick of iodoform gauze was inserted in the large opening, and the external excision was closed, with the exception of its lower third, which was kept open by a small piece of gauze. The gauze was removed from the nose two days following the operation, and the frontal cavity and nose were flushed with an antiseptic solution daily. There was a free discharge for two weeks from the cavity, and at the end of that time, as I did not think the progress satisfactory, I enlarged the naso-frontal duct to ensure complete drainage. The discharge perceptibly decreased after this, and in a week the external opening was allowed to close by granulation. On February 26th, after a stay of one month in the hospital, the patient was discharged. Up to the present time there has been no recurrence of pus in the nose or pain in the head. The patient has gained in weight and enjoys good health.

With regard to the treatment of empyema of the frontal cavity it is advisable in all cases before resorting to the radical or external operation to establish as free drainage as possible between the nose and frontal cavity. This can be accomplished by the removal of all growths in the region of the hiatus semilunaris and naso-frontal duct. In the majority of cases excision of the anterior half of the middle turbinal is necessary to facilitate free drainage. If dependent drainage can be established through the nose, and the cavity freely irrigated, resolution sometimes occurs; on the other hand, in cases of long standing it is usually necessary to resort to the radical operation to effect a cure.

INJURIES TO THE HEAD AND FACE FROM FORCEPS WITH
REPORT OF CASES FROM THE CLINIC OF THE
MONTREAL FOUNDLING AND SICK
BABY HOSPITAL.

BY

RIDLEY MACKENZIE, M.D.

Opportunity is seldom afforded to study pathologically the injuries inflicted by the use of forceps in labour. The difficulties met with in artificially rearing institution children, gives me the opportunity to show these specimens. The three cases I report came within a month of each other under my service at the Montreal Foundling and Sick Baby Hospital.

H. H., aged 8 days, weight on admittance 6 lbs. 8 1-2 oz.; poorly nourished. On the right side of the head between the parietal eminence and the centre line a large purplish swelling was seen, tense and not pulsating. On palpation one felt that the fractured edges of the skull could be made out. There were no signs of injury to the brain. The child did not thrive on artificial food and died after being in the hospital a fortnight.

Autopsy revealed the tumour to be an hæmatoma of the pericranium and a spoon-shaped fracture extending from the centre of ossification in the parietal bone to within half an inch of the sagittal suture; the fracture was a complete one but the duramater was not injured.

G. M., admitted one day old, weighing 7 lbs. 11 oz., and well nourished. The head presented two large hæmatomata just above the parietal eminences, the one on the right the larger. The child was artificially fed but lost weight and strength and died after being in the hospital twenty-six days. The tumours were firm and showed deep red under the scalp. On palpation it was difficult to differentiate between the edges of the hæmatoma, the sutures, and possible fractures, there were no evidences of brain lesions. At autopsy no fractures of the skull were found or injury to the brain. The pathological findings were pericranial hæmatoma, with softening of the bone.

The last case presented some additional features.

John Smith, not an unusual name for a foundling, admitted one day old and weighing 7 lbs. 9 1-2 oz.; he lived a fortnight. He presented a large tumour on the right side of the head, a good deal of swelling of the face and an injury to the skin over the left zygoma. The tumour presented the same conditions as the previous ones. A paralysis of the facial nerve developed with conjunctivitis and keratitis and wasting of the muscles of the face. At the autopsy the swelling was found to be a pericranial hæmatoma extending from the anterior fontanelle to within half an inch of the posterior fontanelle and from the centre of ossi-

fication on the right parietal of the sagittal suture, there was also an underlapping of the right parietal bone; there was no injury to the brain. The seventh nerve at its exit was flattened.

The injuries to the head and face usually met with from the use of forceps are: Intercranial effusions of blood; paralyses of the facial nerve; depression and fissure of the skull; pericranial hæmatoma; laceration of the scalp; injuries to the eyes, ears, nose and mouth. These cases present four of the above conditions, namely:—Paralyses of the facial nerve; depression and fracture of the skull; and pericranial hæmatoma.

On studying the etiology of these cases from the position of the injuries, one would think of the possibility of face presentations, but these are rare, 1-300; or posterior vertex positions with the use of short bladed forceps, or again high forceps operation before engagement. The heads were not large, the pelvis may have been small and in the case of the fracture a good deal of compression of the head must have been used, more than the one-quarter to one-half inch allowed to be without danger. Slipping might bring about these hæmatomata, but there was very little if any injury to the scalp.

The treatment of these conditions would depend upon the diagnosis between hæmatoma, with or without fracture. To me it seems a difficult thing to determine, the margins of the hæmatoma becoming hard from the presence of coagulation in the tissues, suggesting fracture with depression. To favour absorption, cold and pressure should be applied, the latter is a difficult thing to do with infants. There was practically no absorption of the blood in these cases, the cachectic condition of the children being a factor in slow absorption. Cheyne and Burchard recommend if no absorption takes place within ten days puncture and drainage to prevent softening and absorption of the bone. This is shown in the last specimen where some slight absorption has taken place. The fracture would be left to itself and the injury to the facial nerve treated by protection to the eye, time and electricity.

HYDROSALPINX: CASE REPORT.

BY

F. A. L. LOCKHART, M.D., Montreal.

Female, single, 22 years old, entered ward "G" of the Montreal General Hospital on February 1st, 1905, complaining of weakness, vomiting after eating, and of her "stomach being sore all over." She has had the usual diseases of childhood and four years ago she had what she

called "abscess in the womb," for which she was operated upon in the Hotel Dieu at Quebec. The operation was an abdominal section, there being at present a cicatrix in the median line just above the pubic bone, but the exact nature cannot be ascertained, as the authorities of the hospital can find no record of the case. The patient states, however, that she was ill for two months after the operation, that tube drainage was used, and that the wound was dressed every day. She has had some pain in the wound ever since, but it has never been sufficiently severe to make her stop work.

Her menstrual history is entirely negative except that she has had no period since the operation. She has never been pregnant. Three weeks before admission she was seized with pain in the abdomen, chilly sensations and vomiting after eating, being confined to her bed. The pain was severe and localised in the centre of the lower abdomen. The bowels



FRONT VIEW.



BACK VIEW.

were constipated during the attack, but they were always more or less so. She now for the first time felt a swelling in the lower abdomen. Four days before admission, she had another attack of pain and vomiting, which lasted until she entered the hospital.

Nothing abnormal could be observed in the alimentary, circulatory, nervous or respiratory systems, and temperature and respiration were normal. Examination of the abdomen revealed the presence of the above mentioned scar in the middle line just above the pubes, and on palpation a rounded firm mass could be felt just beneath the scar, but the latter was not adherent to it. The mass was not sensitive to pressure. Examination per vaginam revealed a profuse white

discharge. The cervix was represented by a small nodule at the top of the vagina and apparently connected with a semi-fluctuating mass the size of a cocoanut. This mass was mobile, non-sensitive, and felt much like an enlarged fundus uteri with thin walls.

The abdomen was opened in the line of the old cicatrix, but somewhat higher, on the third of February. The omentum was adherent to the cicatrix but was easily separated from it. The mass was then seen to be a large right sided hydrosalpinx attached to a firm, fibrous body, which felt like the remains of the uterine wall. There were no adhesions. This fibrous mass was divided across, in doing which a large vessel was cut and ligated, and the tumour removed entire. Attached to where one would look for the stump of the left tube was a small thin-walled cyst, the size of a walnut, which was removed. The pedicle of the larger tumour was now closed by a continuous catgut suture as after a pan-hysterectomy, the abdominal cavity was wiped dry and the incision closed in three layers as usual.

DESCRIPTION OF SPECIMEN.

The mass consisted of the right fallopian tube enormously distended with fluid. For the first 7.5 cm. it was but slightly enlarged measuring only about 5.75 cm. in circumference, but after that it became rather suddenly distended until it ultimately measured at its largest part 32 x 57 cm. The wall was exceedingly thin and tense.

The pedicle consisted of a firm fibrous mass, 6 cm. in length by 21 cm. in thickness. It contained a cavity from which a firm, yellowish-white mass was extruded. This mass under the microscope revealed no formed structure but was homogeneous, and the wall of the cavity contained nothing but fibrous tissue. The smaller cyst removed from the region of the left broad ligament was unilocular and, under the microscope, showed nothing but fibrous tissue.

JOHN HUNTER.

BY

W. W. CHIPMAN, M.D.

In September, of the year 1748, a young man of twenty, rode on horseback from his native Scotland up to London. He was short in figure, strongly built, his curling red hair covered a large head set close upon broad shoulders, and the wide grey eyes looked forward to the meeting with his older brother, to beginning the study of medicine, and all his world to conquer. Forty-five years later, in October of 1793, this same

man was carried reverently by his colleagues, in a sedan-chair, out of the portals of St. George's Hospital, London, to his home in Leicester Square, only now the tale of his life-time is told, the hair is white and the eyes are closed for ever. Thus began and thus ended the forty-five years of the working life of John Hunter, "the greatest man in the combined character of physiologist and surgeon that the whole annals of medicine can furnish."

It is always interesting to learn the genealogical facts associated with the production of a great man, or a family of great men, even though the sum total of these facts leaves us with a *result* altogether disproportionate. In a biological sense we know little of cause and effect, and it is not surprising that we cannot argue from the one to the other. The man of genius the *effect*, stands out the child often of commonplace parents, the cause, the one seems entirely inadequate to produce the other; and again inversely, the most promising marital unions are frequently the most niggard in results. There must be laws which govern propagation and inheritance, but as yet these are unrevealed, only do we know that in this great biological kingdom there is no oligarchy of genius, rather is it a republic, for does not Jack often propagate his species to higher uses than his master.

For example,—A laird, by name John Hunter, of a small freehold in Lanarkshire, marries Agnes Paul, the daughter of the Treasurer of Glasgow. The laird is in no way distinguished, is but frugal and upright, and his wife possesses a kind and lovable disposition; nevertheless as a result of that union there is given to the world of a family of ten children, the two famous sons, William and John, "who raised themselves to the highest positions in Science," and a daughter, Dorothea, who marrying James Baillie, an ordinary Professor of Divinity, gives birth in her turn to Dr. Matthew Baillie, for many years the first physician in London, and to Joanna Baillie the poetess, the "immortal Joanna" of Sir Walter Scott. In the words of Jonathan Hutchinson "it is doubtful whether the annals of biography can produce a more striking example of the production of what we may call *family-genius* than that which resulted from the union of John Hunter and Agnes Paul."

Such then was the family heritage of the great son, John Hunter. "Jockie," as he was called, was the youngest of the ten, younger than his brother William by ten years, and born when his father was 70 years of age. When in his turn he was ten his father died and he was left to the care of his mother, a somewhat unruly but affectionate boy, a truant

at school, fond only of games and out-of-door sports. His education was rather of a hap-hazard sort, he had no taste for study or books and at seventeen could scarcely read or write. As he afterwards said of himself, "I wanted to know all about the clouds and grasses, and why the leaves changed color in the autumn. I watched the ants, bees, birds, tadpoles and worms; I pestered people with questions about what nobody knew or cared anything about." When he was seventeen his mother in sheer desperation apprenticed him to his brother-in-law, one Buchanan, a cabinet maker in Glasgow. Here he remained three years, but beyond the acquisition of a certain manual dexterity he made nothing of it, and at the end of that time he returned home to his mother. John Hunter was now twenty years old and truly the years of his youth had been lean years and the future was dark and unpromising. But now there came an invitation from his brother William to join him in London, and so in September, 1748, he set out on horseback and his mother sees for the last time the freckled, smooth-shaven, strongly featured face, the short, square figure of her youngest born. John Hunter has gone to London, the days of idleness and irresolution are over, for he has begun to work.

This journey of John Hunter's to London was in an educational sense the return of the prodigal son, only instead of his father's house it was his older brother William, who welcomed and took him in. This brother had been a brilliant and diligent student from the first. Graduated in Arts from Glasgow University, he had spent three years as an apprentice in Medicine with Dr. Cullen, of Hamilton, who was afterwards to become the famous Edinburgh Professor. A partner in Cullen's country practice, he soon left him to spend a winter in Edinburgh under the great anatomist, Monro, and finally in 1741, seven years before the advent of John, he went up to London. Here by his skill, manual dexterity and brilliant abilities he rose rapidly, studying under various teachers, chiefly anatomy and surgery. His great ambition to become a teacher was realized, when, five years later, he succeeded William Sharpe, the St. Bartholomew surgeon, as a Lecturer in Surgery. This course of lectures he greatly extended and added thereto a course in anatomy.

Previous to this, anatomy in England had been taught almost entirely in an indirect and descriptive way, lecturers or readers being chosen by the Barber-Surgeons from among the ranks of the physicians to deliver an annual course of lectures in the Barber-Surgeons' Hall. These physicians were seldom or never practical dissectors, only were

they familiar with the Latin tongue and read in the works of Galen, Vesalius and Harvey. One cadaver was deemed sufficient for demonstrating all parts of the body, the lecturer quoted largely from these old texts and trusted mainly to their fanciful drawings and diagrams. Among these Physician-lecturers had been John Caius, the founder of Caius' College, Cambridge; Harvey, Glisson, Mead, Cooper and Willis. This Barber-Surgeon alliance which had controlled in England the practice of surgery for 200 years, a strong, close and jealous corporation, quite ready to impose a fine of £10 upon anyone dissecting a body outside their Hall, and both unable and unwilling to conduct these dissections within it, was very fortunately in this year 1745, finally dissolved. The time was critical in the teaching of anatomy, for there existed a universal horror of all anatomical pursuits and practical dissection was generally unknown. William Hunter seized the opportunity, advertised "to instruct gentlemen in the practical art of dissecting as it is taught in Paris," and despite a pious and professional hostility he succeeded at last in placing the teaching of anatomy upon a practical and scientific basis. His was the first school of the kind in England (the Monros in Scotland had slightly anticipated him), it grew rapidly in prosperity and soon became the first teaching centre in London.

It was at this school in Covent Garden, with its dissecting-room at the back, that John Hunter, the younger brother, arrived in that September of 1748. William's private practice had by this time greatly increased and chiefly in the direction of midwifery. He was soon to be known as the best anatomist and accoucheur in London, and afterwards in attending Queen Charlotte had the distinction of being the first male accoucheur employed by any of England's Queens. It was to relieve William in the work of the dissecting-room that "Jack" Hunter as he was now called, was put to work that morning in September upon the exposure of the muscles of the fore-arm, upon his life's work. The brothers are now together and for ten years they so continued, William delivering the greater part of the lectures, writing papers and busy with practice, while John, soon a skilled dissector, was mounting specimens, prosecuting the researches and teaching the hack-work of the dissecting-room.

Comparisons between these two brothers have been and will always be, inevitably instituted. How that William, though of great professional attainment, of sound education and wide, diversified tastes and the author of the monograph "Anatomy of the Gravid Uterus," the ablest work of its time, and sufficient alone to make him immortal, lacked the originality, the scientific insight and foresight of the younger brother

John, the "Founder of Scientific Surgery!" Compare them as we may we must always remember that William was the pioneer, that without him there would have been no John and that their respective work, shot each through and through with the influence and individuality of the other, and which truly does live after them, is monumental to them both, one and indivisible.

With the two brothers at work in Covent Garden let us place about them, very broadly drawn, the setting of their own time.

"Farmer" George was King of England, and among his Crown Ministers were Lords Grenville, Rockingham and North; Fox and the two Pitts. Peter the Great had been dead some few years and Charles the Pretender had already suffered defeat at Culloden. The history of the time includes the great earthquake at Lisbon; the Seven Years War with the French, with the incidents of the Black Hole of Calcutta, and the taking of Quebec by Wolfe; the winning of their Independence by the American Colonies and the beginning of the French Revolution. Louis XVI. perished on the scaffold six months before the death of John Hunter, and on the very day of Hunter's own tragic end there fell by the guillotine the head of his Queen, Marie Antoinette. Paré, the great French surgeon, the inventor of the ligature, had been dead nearly 200 years. Exactly a century before John Hunter was born, Francis Bacon died and Harvey published his great work on the Circulation of the Blood. Wiseman, the father of English surgery, and Sydenham were dead already some forty years, while Newton had lived till just a year before his birth. Voltaire was thirty years older than Hunter and Haller the indefatigable Professor at once of medicine, anatomy, botany and surgery in the University of Göttingen, was 20 years his senior. The renowned Boerhaave died at Leyden when Hunter was ten, and the year he came to London, Goethe was born. Of the great naturalists Grew and Ray belonged to the previous century, but there lived as contemporaries Buffon, Linnaeus and Cuvier.

Among those whom the Hunters possibly met in London were John Howard, Wesley and Wilberforce, Pope, Adam Smith, Benjamin Franklin, Cavendish and Davey, Dalton and Herschell, Grose, Sir Joshua Reynolds, Erasmus Darwin, Priestley and Benjamin West, and doubtless they occasionally saw the acting of David Garrick and Mrs. Siddons, while the link-boy and sedan-chair were still met in the streets.

Chief among the Hunters' professional brethren were the following:—Cheselden, the great and kindly surgeon of St. Thomas, who so successfully "cut for stone," adopting first the supra-pubic, and later the

lateral perincal operation, and by this latter method often cutting as many as 27 without a death. Percival Pott, surgeon at St. Bartholomew's, who already was protesting against the actual cautery and charcoal-pan, the suppuratives, digestives and sarcotics by which the older surgeons checked bleeding and dressed their wounds, using himself the more kindly ligature and bland and simple dressings. Not yet had he been thrown from his horse in Kent Street and suffered his famous fracture, while the "Treatise on Rupture," and his additions to surgical pathology in respect of "tumour albus" and vertebral caries, the resulting curvature from which still bears his name, were yet to appear. Among other surgeons Mr. Bromfield and Sir Caesar Hawkins were at St. George's; Samuel Sharp and Warner at Guy's. Of the physicians were Heberden, John Fothergill, Radcliffe, Richard Mead, Lettsom and Thomas Dover; while Smellie the obstetrician, was busy perfecting from Palfyn's *livé tête* his famous *midwifery forceps*.

The medical teaching of the time may be judged both in its quality and extent by the following:—Mr. Nourse, the chief surgeon of St. Bartholomew's and Pott's old master, professed to teach "totam rem anatomicam" in 23 lectures; Mr. Bromfield, a lecturer of note comprised anatomy and surgery in thirty-six, and Dr. Nicholls, at whose school William Hunter studied, taught anatomy, physiology and the general principles of pathology and midwifery in 39 lectures.

The professional and social gulf between the physicians and surgeons, digged in the Middle Ages, was still imperfectly bridged. The physicians were as a rule, better educated and still counted themselves greatly superior to the surgeons, for Charles Bernard, who is remarked as the first English surgeon who was an *educated* gentleman, had only died in 1711. Their college founded by Linacre, had already been in existence some 200 years and had during that time slowly gathered to itself the strength of custom and tradition. The physicians proper, the "medici puri" were still inclined to boast as their inheritance the profound gravity, the fur-trained robes, perukes, canes and swords affected by their predecessors, and the consideration that service other than a formal prescription was beneath their dignity.

The surgeons on the other hand, had not yet achieved a complete social emancipation. Throughout the Middle Ages their degradation had been greater than that of the physicians, for at that time, while the practice of medicine was a clerical right, the Church forbade, on pain of excommunication, the letting of blood. Consequently, surgery was shunned by the Ecclesiastics and fell into the hands of the ignorant and

vulgar,—the barber, the bather and bone-setter. The redemption of surgery from these vulgar hands was the work of nearly three centuries, and was not completely achieved in England till the dissolution of the Barber-Surgeon Company in 1745. The Court of Assistants of the Corporation of Surgeons was founded in Hunter's time, he was one of its first masters, and it was this corporation which in 1800 became by Royal Charter, England's College of Surgeons.

John Hunter lived in stimulating times, let us now see how worthy of his time he proved himself to be.

In William's school he began simply as a practical dissector and soon proved himself an adept at the business. Before the end of the year, so rapid was his progress, he was entrusted with the charge of directing the pupils in their dissections and of preparing the subjects for his brother's lectures. He found himself in his element, and the mind which had recoiled with disgust from the dry routine of scholastic pursuits was aroused and attracted by the congenial objects which on all sides confronted him. His ambition was fired to become not only a surgeon but also an anatomist.

During the summer months he studied surgery, attending first the Chelsea Hospital under Cheselden, and later Saint Bartholomew's under Pott, and it was from these two men that Hunter received his first lessons in the surgeon's art. Within two years of his arrival in London he was fairly embarked upon his professional life. His industry and zeal were phenomenal and his capacity for work was enormous. A roughish sort was "Jack" Hunter, head-strong and intolerant, and a great favourite with the "resurrection men." His brother with his scholarly attributes and gentlemanly manners, was at this time his good and guiding genius and soon about the Covent Garden School and home were gathered the leading, professional and lay intellects of the day.

In 1753 John entered as Gentleman Commoner at St. Mary's Hall, Oxford, probably persuaded thereto by his brother, for his great deficiency in expressing himself both in speech and writing was painfully manifest. To the day of his death he never made entirely good this deficiency, for he could not stand it at Oxford, in his own words "to be stuffed with Latin and Greek and made an old woman of," and soon leaving it, finally relinquished all thought of a polite education.

The following year he was entered as surgeon's pupil at St. George's Hospital and two years later became house-surgeon at the hospital. a post equivalent to surgical registrar of our own day. At this time too, he was made partner in the school and a certain share of the lectures allotted him, but it was in the dissecting-room always that he felt himself

most at home. All his leisure time he devoted to anatomical research and to the preparation and collection of specimens. His reputation as a skilled anatomist became rapidly and widely known, and at this time he was only laying the foundation of his real work that was yet to come. In the words of Stephen Paget, "John Hunter went forward from human anatomy to all anatomy and physiology, and from these to medicine and surgery; from all of them to the profound study of life, alike in health and disease, in all structures, at all stages."

It was about this time that Hunter made his famous dissection of the human placenta. The story goes that Dr. Mackenzie, an assistant of Smellie's, had succeeded in injecting the arteries and veins of the uterus of a woman dead at term. Not being able to interpret what he saw he called in Hunter who succeeded in tracing these arteries and veins to their terminations in the sinuses of the decidua. In the evening he communicated these discoveries to his brother William, who extremely sceptical at first, was, on seeing the specimen, at once convinced. This, the first demonstration of the true nature of the maternal placenta gains always a melancholy interest from the fact that some twenty years later it was the occasion of the final quarrel and estrangement between the two great brothers.

Other researches made at Covent Garden were:—(1) The demonstration of the lachrymal ducts in man. (2) The demonstration of the tubuli seminiferi. (3) The discoveries relating to congenital hernia. (4) The discovery of the lymphatic absorbent system. These all were triumphs of John's wonderful skill, patience and ingenuity. While he worked, dissected and demonstrated, William taught and wrote. After the fashion of the times these writings were vituperative to a degree, for the Monros of Edinburgh and Percival Pott, were also in the field of discovery and many and bitter were the contentions to priority of the several claimants. In these disputes, charges of stupidity, falsehood and theft were common tender and always the Hunters proved themselves doughty opponents.

And now the over-work and close confinement told even upon the health of John Hunter and he was advised to go abroad, "having complaints in his breast which threatened to be consumptive." Through the influence of his brother he was appointed a staff-surgeon in the army, and England being as usual, at war, early in 1761 he sailed under Keppel for Belle Isle and saw active service with the fleet. The following year he followed the land campaign in Portugal being in all, two years out of England. This active service completely re-established his health, afforded him material for his great "Treatise on Gun-shot Wounds,"

and gave him many opportunities for physiological experiment and investigation.

We read from his own pen of his observations on the arrest of digestion by hibernation, that, "At Belleisle in the beginning of the winter 1761-62, I conveyed worms and pieces of meat down the throats of lizards, when they were going into winter quarters, keeping them afterwards in a cool place. On opening them at different periods I always found the substances which I had introduced, entire and free from alteration, sometimes they were in the stomach, at other times they had passed into the intestine and some of the lizards that were preserved alive voided them towards the spring, with but very little alteration in their structure." Such was one of a multitude of observations made at this time.

Hunter came back from the Peninsula in 1763, thirty-five years of age; his only income in the world his half-pay. His partnership with his brother dissolved, he settled in London as a surgeon and started practice in Golden Square. And it was an uphill fight. His manner was abrupt, often even coarse and repellent. Eminent surgeons possessed the field, and he was unknown save as a skilled anatomist, more anxious to dissect than to cure. Even in his own estimation practice was always of secondary importance, and throughout his life it was ever with reluctance that he laid aside for its sake his scientific pursuits. "Well I must go and earn this damned guinea or I shall be sure to need it to-morrow," fairly characterizes the true attitude of his mind. His progress at first was slow. To eke out an income he delivered private lectures on anatomy and operative surgery, but his pupils never numbered more than twenty. In his leisure hours, they must have been many in those early years, he renewed his studies in comparative anatomy, securing by hook or by crook, all animals of whatsoever kind. His house became a menagerie, overflowed utterly, till in the following year he secured two acres of land about two miles from London, near Brompton, at a place called Earl's Court. Here he built a small house and gathered together whatsoever beasts of the field and birds of the air he could buy, borrow or steal. He observed their habits, experimented with them and in the end dissected them, whether it was a 17-foot whale or O'Brien the Irish giant.

Hunter's income for the first eleven years of his practice never amounted to a £1,000, but in 1767 he was elected a Fellow of the Royal Society, and in the following year obtained the position of surgeon to St. George's Hospital, his old clinical school. This latter appointment while it brought a rapid increase of practice, entitled him to take

“house pupils” each apprenticed to him for five years at a fee of £500. Among the first of these pupils were Mr. Guy of Chichester, Dr. Physick of Philadelphia, and most famous of all, Edward Jenner. Soon after his appointment to St. George’s he was made a member of the Corporation of Surgeons, he published his first book, a “Treatise on the Natural History of the Human Teeth,” he married Miss Anne Home and moved from Golden Square to better quarters, his brother’s former house, in Jermyn Street. Fortune had at last begun to smile upon him, for both his private practice and professional character were advancing fast.

The increase of his professional duties served only to stimulate him to further scientific investigation, he was always, at every spare moment, engaged in innumerable dissections, observations and experiments. His letters to his friends bristle with requests to procure for him all sorts of things, animate or inanimate, from lions to lizards, from porpoises to pigeon’s eggs. Already he was making the beginning of his wonderful museum and all the best rooms in his house were soon choked to overflowing. A patron of his, Lady S., sent a specimen of a giraffe. He could not make room for it, “so in order that it might be in sight he cut off its legs and fixed it in the passage.” His country home at Earl’s Court resembled nothing so much as a modern Noah’s Ark, with its buffaloes and bees, snakes, birds and a lion’s den.

Hunter’s day began at six in the morning. He worked in his dissecting-room till nine when he breakfasted, and from then till noon he saw patients. He then set forth for his hospital and private rounds and returned to dine at four, the fashionable dinner hour. After dinner he slept for an hour and the evenings were occupied in recording his cases and observations and preparing and delivering lectures, continuing this work till one or two o’clock in the morning. He allowed himself about four hours sleep and no relaxation of any kind save an evening stroll among his various animals at Earl’s Court. Is it any wonder that his health at forty-five began to seriously fail, for it was then he suffered his first attack of angina.

He now at 43 began to publish the results of his investigations. It is rather characteristic of the type of man that of his first seven papers presented to the Royal Society, five of them dealt with questions in comparative anatomy or physiology, one in pathology and only one of the seven with *treatment*; and this may be taken to fairly represent the relative importance of the respective subjects in Hunter’s mind.

In 1773 he gave his first course of lectures on the principles and practice of surgery, advertised in Hunter’s own words, “to introduce so much of the animal economy as may be necessary to illustrate the

principles of those diseases which are the objects of surgery." These lectures magnificent in quality, and far in advance of the time as they undoubtedly were, were scarcely very popular for Hunter was not at his best as a teacher. He was nervous, diffident and rather awkward in speech. Still his diction at times must have been forcible enough judging from the preserved specimens of his description of a gun-shot wound, where the ball "went into the man's belly and hit his guts such a damned flump that they mortified." He trusted nothing to memory, simply read his lectures, hardly lifting his eyes from the pages, and we are told that before his opening lecture he often took to steady his nerves 30 drops of laudanum. But he was fearless and independent in the pursuit of truth. To opinions he attached no value whatever save they were firmly based on fact. His own beliefs he changed frequently observing that "I hope I grow wiser every year. And he attracted and counted among his students most of the eminent surgeons who succeeded him:—Home, Carlisle, Abernethy, Astley Cooper, Cline and Macartney, men all who determined the spirit of their time.

Hunter was now in the full swing of his work and like Swift he truly "tore through life;" his practice continued to grow, for when Pott died, a few years later, he became the foremost surgeon in London. But the steady resistless flow of researches never ceased. His museum grew by leaps and bounds as he continually endowed it with the results of his labors. Even the life-long friendship with Jenner was doubtless cemented by a community of scientific interest, for Hunter had small time for the ordinary amenities of life and his personal friends were few. To Jenner, sorely disappointed in a love affair, he writes, "Let her go, never mind her. I want you to get a hedgehog in the beginning of winter and weigh him, etc., etc." two succeeding sentences which must have meant a somewhat abrupt transition in the mind of Jenner. Yet it was to this "dear master" as he called him, that Jenner always turned for inspiration and assistance.

Hunter was now earning £6,000 a year and every penny that could be spared, he spent in adding to his collection and very often he was fain to borrow from his friends. His mind was like a bee, and he ransacked the world for all sorts of living and creeping things, plants and even minerals. One subject of investigation after another suggested itself and the extent and versatility of his researches may be judged from his mental output of one year: "A description of the situation of the Testis in the Fœtus with its descent into the Scrotum;" "Observations on the Glands situated between the Rectum and the Bladder, called the Vesiculæ Seminales;" "On the Structure of the Placenta;" "Some

Observations on Digestion;" "On a Secretion in the Crop of Breeding Pigeons for the Nourishment of their Young;" "On the Color of the Pigmentum Nigrum in different animals;" "The use of the Oblique Muscles;" "A Description of the Nerves which Supply the Organ of Smelling;" "A Description of Some Branches of the Fifth Pair of Nerves;"—were papers all published in the course of a year, not half a bad year's work.

"Even in his old age, full of suffering, over-worked, and close to death, he was yet writing to Africa for swallows, ostrich eggs, a camel, cuckoos, a young lion, bees, chameleons and any other beast or bird."

And now this passion for anatomy which had been the lode-star of their lives, was to be the occasion of a great and final quarrel between the two great brothers. The dispute arose over their counter-claims to the discovery of the Structure of the Placenta, the work done on Dr. Mackenzie's specimen some twenty years before. John was the aggressor and yet his claim appears the more righteous. The quarrel waxed bitter and was never repaired, for three years later William died, and though John ministered to him at the last, the brothers made their final separation, unreconciled. John had ten years yet to live.

The year of his brother's death he moved to a large house in Leicester Square and in connection therewith he built a museum and a lecture theatre, with dissecting-rooms adjoining. This, while it laid him under a further financial burden provided him with a suitable home for all his vast collection of preparations and specimens. Here at last these were housed, arranged and classified, for Hunter a veritable labor of love. This museum was the great labor of his life, the principal record of his deeds and opinions. In it he collected some 14,000 specimens, a vast store-house of preparations of anatomy, human and comparative, histology, physiology, morbid structure, plants and fossils. Hunter dissected at least 500 different species of animals, making, moreover, numerous repeated dissections of the same species, and many hundreds of plants. He added to these thousands of preparations in human anatomy and pathology, skulls of all nations; two thousand stuffed animals and three thousand fossils. He made preparations to display the distinctive characters of each animal, and left an enormous quantity of manuscript-description, drawings and notes. This museum has been aptly called Hunter's chiefest monument. His object was to illustrate the whole question of life, both in health and disease, and superhuman though the task, he succeeded. For it he suffered, slaved and sacrificed; he was always poor, for it cost him £70,000, and dying, its money value was the sole fortune he had to bequeath. Six years after his death Pitt was

providentially persuaded to buy this museum for the nation, and he paid for it £15,000 though he had scarce money wherewith to buy powder, and it was given in trust to the Royal College of Surgeons, where it still remains.

The last ten years of Hunter's life was one long martyrdom. He had suffered his first attack of angina two years before, but the seizures now recurred with pitiful frequency and he was scarcely or never entirely free from pain. In his own words "My life is in the hands of any rascal who chooses to annoy and tease me." If anything, his energy was redoubled, for during this time he planned and executed his great operation for aneurism, operating upon five cases; wrote some thirty original papers and published two of his large works, "The Treatise on the Venereal Disease," and "Observations on Certain Parts of the Animal Economy." He was engaged upon his great "Treatise on the Blood, Inflammation and Gun-shot Wounds," when the end came. In addition he was still lecturing, giving clinical instruction at the hospital and driven with private practice. A wonderful history it reads of a strong man's struggle against increasing disability; shattered, suffering, resolute. All treatment was useless, even that of Jenner's. Gradually sheer exhaustion shortened the excursion of his activities, but his great vitality held on. In better than his usual spirits he reached St. George's Hospital on that fateful 16th of October. The end came tragically. In the midst of a heated discussion an attack of angina seized him and he staggered from the board-room only to fall into the arms of two of his colleagues where he died.

Such was the passing of John Hunter, in 1793, at 65, the same age as William his brother. Two days later his body was quietly interred in the Church of St. Martin-in-the-fields.

"John Hunter was a profound philosopher, a great naturalist, a pre-eminent collector and the foremost surgeon of his time." He was the first who practised and taught surgery as a branch of the science of life, the first *scientific surgeon* and upon this his irresistible claim to greatness rests. Previous to his time surgery was merely an art, rules of observation and experience, isolated or but loosely linked together. Nothing was known of the real nature of disease, for even of the normal functions of nutrition and absorption, growth and repair, there was almost entire ignorance. Hunter perceived the want of this knowledge and clearly saw that it alone could furnish a sure foundation for the *healing art*. In Otley's somewhat quaint phraseology "Hunter was the first to realize that in order to obtain just conceptions of the nature of those aberrations from healthy action, which constitute disease, it was

necessary to understand the healthy actions themselves, and these not in man alone but throughout the whole animal series and even in vegetable life." His was no less an undertaking than the study of the phenomena of life, in health and disease, throughout the whole range of organized beings, and to this study he devoted the almost super-human energies of his life. There had been none like him in scientific zoology since Aristotle, for through the long twenty centuries, as students of natural history there were none equal to these two;—the one the son of the Stagira physician, the other of the Calderwood laird. So Hunter was able to transform surgery from a barren account of isolated cases into a science founded on anatomical, physiological and pathological knowledge. He carries us beyond mere handicraft into the region of general principles. "The Surgery of the Middle Ages was a trade. Pare, Petit and Pott converted it into an art. Hunter elevated it to the rank of a science."

His loftiest efforts are to be found in his work on "The Blood, Inflammation and Gun-shot Wounds," which may be fairly counted his masterpiece, for in it there is foreshadowed, upon the principles therein enunciated, is based, the whole subsequent progress of scientific surgery. Much of it makes almost inspired reading so faithfully have its promises been fulfilled.

His "Treatise on the Venereal Disease," though impaired in its scientific value by his belief that gonorrhœa, soft chancre and syphilis were due to one and the same virus is full of painstaking research, accurate observation and sound treatment. We can scarcely wonder at Hunter's error for when experimenting in 1767 with some pus which he thought gonorrhœal he accidentally inoculated himself therewith. A hard chancre and secondary syphilis developed, which he faithfully treated with mercury, and he tells us "the time the experiment took up from the first insertion to the complete cure was about three years." In the treatment of urethral stricture he advises that the common bougies of lead or wax candle be discarded, and there be substituted his own bougies of hard rubber. His classic description of chancre,—the Hunterian chancre, stands to-day adequate, as it left his pen.

His "Animal Economy" embraces 47 original articles, chiefly in anatomy and physiology. Verily it is a marvellous collection of unique range, for in it are found observations on Fossil Bones, on Digestion, on Bees, on Whales and Kangaroos, with experiments on the Growth of Bones and the Absorption by Veins.

As an operating surgeon, Hunter was not the equal of Cheselden or Pott, but he was bold, steady and accurate. In this connection, with his

name are always associated:—Aneurism and its Treatment by Proximal Ligature, Phlebitis, Intussusception, Treatment of Gun-shot Wounds; Feeding through a Stomach Tube, and the Transplantation of Teeth; while his phrase "healing by first intention," will forever remain in our surgical literature.

These very shortly were some of Hunter's contributions to surgery, and the ensuing years have but enhanced their value and importance. Lawrence has written that, "we could well spare the works of any surgeon except Hunter, for they would hardly be missed. But if Hunter's researches and his writings were obliterated and their influence withdrawn, the very life-blood of surgery would be lost, it would be a body from which the vital principle had departed."

"Let no man presume to call himself wise," says Pythagoras, "God alone is wise. Man can never get beyond the passion for wisdom." It was this *passion for wisdom* that filled the soul and inspired the life of John Hunter.

Sixty-six years after his death, the body of John Hunter was removed from St. Martin, to the Abbey that "makes us we." He lies there in the North Aisle and above is written "The Royal College of Surgeons of England has placed this tablet over the grave of Hunter to record its admiration of his genius as a gifted interpreter of the divine power and wisdom at work in the law of organic life, and its grateful veneration for his services to mankind as the *Founder of Scientific Surgery*."

A new company, under the name of the Chandler and Mills, has been formed to deal in physicians' and surgeons' supplies. Amongst the shareholders are forty physicians of Montreal and the province.

It is understood that the appointments of Dr. Geo. H. Parke as Principal Medical Officer of the Quebec District, and of Dr. Geo. Turcot as Surgeon for the Quebec Arsenal, will be gazetted in the course of a few days.

Billroth, in writing to a Russian surgeon regarding the fatal malady of Pirogoff, a palatal neoplasm, refused to operate or to advise an operation, saying:—"I am not that bold operator whom you knew years ago in Zürich. Before deciding on the necessity for an operation I always propose to myself this question: 'Would you permit such an operation as you intend performing on your patient to be done on yourself?' Years and experience bring in their train a certain degree of hesitancy (*Zurückhaltung*)."

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MCGILL AND BISHOP'S.

It would be too transparent an affectation of ignorance to pretend any longer that we were unaware of the negotiations which have been in progress this past year for a merging of the Medical Faculty of the University of Bishop's College into the Medical Faculty of McGill. We are informed that the arrangement is as good as completed, though the exact nature of the agreement has not yet been disclosed. There is reason, however, to believe that it is one which will deserve the enthusiastic approval of the faculties, graduates and students of both Universities.

The Medical Faculty of Bishop's College was founded nearly thirty-four years ago, and during that time it has well served the cause of medical education by the practical training which it gave to its students, and by the experience which it yielded to teachers who were

afterwards called to a wider field. The high standing which many of its graduates have obtained in the profession, and its professors who have passed into other faculties may be put forward in proof of this. For example, five of the present professors in McGill and six junior teachers obtained their first experience in Bishop's. The graduates who have attained to distinction would be long to name.

But in these years the circumstances of medical education have changed. In the old days, all which was considered necessary for making a complete physician was a lecture-room and a few bodies for dissection. It is unnecessary to specify here the requirements which are essential to-day, but during the past few years the Faculty of Bishop's College have been reminded continually of them. Finally they were obliged to face the difficulty, through the resignation of their Dean, Dr. F. W. Campbell, on account of illness, increasing age, and other matters personal to himself. They were compelled to take note of the comparative inefficiency of the small school and the modern tendency of schools to come together; of the diminishing English-speaking population in the Province of Quebec; of the increasing demands of medical students for a wider knowledge; of the rivalry of schools in neighboring cities; of the increasing demands of life which prevent practitioners from engaging largely in other occupations than that out of which their livelihood comes.

These circumstances became more pressing, when they reflected upon their small endowments, their inconsiderable laboratory equipment, the lack of clinical faculties directly controlled by themselves, the continuous depletion of their number by promotion to wider fields. On the other hand, they perceived that if the medical school were absorbed into a larger body, certain definite advantages could accrue; namely, relief to the teachers from work which could be as effectually done elsewhere; an obliteration of the division in the profession, which always results from the presence of two schools, where one would serve; a more complete union of the English-speaking part of the profession, which would in time lead to a better understanding in the profession as a whole.

Accordingly a conference was sought with McGill Medical Faculty, when the whole matter had a full and frank discussion, and both parties proved that they were actuated by the same desire, to make medical education easy—where once it had been difficult. The two Universities gave cordial assent to the proposal which had been agreed upon by the respective faculties, and we understand they are now engaged upon the details of the scheme which, after all is a University matter.

It is altogether likely that there were many difficulties to be overcome

of which we have not heard, arising out of sentiment and out of fact, and the negotiations must have been cleverly handled in order to reach so desirable an issue. But, in truth, the trend of events favoured. Many members of the Faculty of Bishop's are graduates of McGill, and many members of the Faculty of McGill were once teachers in Bishop's. Their lines, social and professional ran together at several points, and it was easier to come wholly together than to remain apart. There are also other evidences of this better spirit. The united banquet of the French and English members of the profession and the merging of the *Canadian Medical Record* with this JOURNAL are cases in point.

We have not yet been informed as to the exact details of the agreement; yet, without being wiser than the matter demands, we may surmise that the University of Bishop's College will surrender its rights to teach medicine in Montreal for a term of years if not permanently; that all their students will be accepted *ad eundem gradum* by McGill; that they will in future pay the same fees as are now exacted; that all the property now held by Bishop's, endowments and moveable property, shall be taken over at a valuation, and that all leases shall be respected. Having in view that a union of hearts, is as essential as the merging of more palpable interests, we understand that arrangements have been made for doing just honour to the late Dean of Bishop's, for conferring McGill degrees upon the members of the Faculty, who do not possess them, upon such graduates as shall be agreed upon, and for incorporating the names of all the graduates into the McGill Calendar.

We are not altogether clear as to the question of appointments which may be made to McGill, but we understand that the members of the staff of Bishop's College would not agree to accept positions as a necessary result of the union, claiming that any such appointments should be made as required, and entirely on the ground of efficiency. If this be so, it is taking extremely high ground, and, we think, a correct position. An appointment as part of a "deal" is no compliment, and might not be satisfactory to either side. As a matter of course, hospital appointments continue to rest with the hospital authorities and not with the faculties.

Bishop's College has in a sense passed a self-denying ordinance, a term Dr. Osler employed in his memorable address before the united Toronto schools. Indeed we are not quite sure that the present negotiations did not arise from that suggestion. If this is in some degree self-sacrifice, it is worth keeping in mind that no sacrifice is ever in vain, and the present Faculty of Bishop's College is likely to be remem-

bered as a body of men who subordinated personal interests to the general good.

There is one matter which yet remains for consideration, namely the representation upon the Council of the College of Physicians and Surgeons. At present McGill and Bishop's each send two members. Without an independent Faculty of Medicine in Bishop's University, a strict interpretation of the law might reduce that representation from the English-speaking schools to two, but we feel that the legislature can be trusted to follow the course which justice and reason would indicate.

THE ALEXANDRA HOSPITAL.

Time brings its revenges, and Montreal instead of hanging its head over the Civic Hospital and the great lack of equipment with which to combat infectious diseases is likely in the near future to grow too proud in this regard, for the Alexandra Hospital has now been born, and we wish it a speedy growth and a long life. Thanks to the consistent work of a few determined individuals, the building and equipment is to be on a scale commensurate with the importance of the city; and it is here emphasized that the public has not only to "point with pride," but it has to support by a liberal response the claims of the Alexandra Hospital; lest it should not be remembered, subscriptions will be gladly acknowledged by Mr. E. S. Clouston of the Bank of Montreal, or Mr. T. A. Barton, secretary of the Alexandra Hospital, 16 St. Sacrament street.

The hospital will accommodate 125 patients, and in case of epidemic 187 can be cared for; the total cost will be about a quarter of a million dollars. The contracts have been awarded and work has begun; the site is a lot with nearly 500 feet street frontage, at Point St. Charles, on the river bank; half a mile above the Victoria Bridge; if one may judge by the published details of buildings, the plans provide excellently for isolated pavilions of modern construction, which will be fireproof: concrete, steel, terra-cotta, brick and stone, are the materials to be used. The buildings will consist of five pavilions, grouped like the points of a pentagon, connected, not with one another, but each with the centre, which again is connected with the administration building; of the five pavilions, two small ones are for observation of cases and for erysipelas, and the three main ones will be devoted to diphtheria, measles and scarlet fever. At one side of the lot will be a small building consisting of chapel, mortuary and ambulance quarters. The floor will be "monolithic," the walls and ceilings of hard plaster, enamelled, and the wood necessary for sashes and doors will be of minimum quantity, and without

mouldings or any inequality of surface that might prove a lodging place for germs. The mode of preventing infection spreading from one pavilion to another, is by the use of fresh air cut-offs at the entrance of each building; the diphtheria ward is to be equipped with an operating room for surgical emergencies arising from the disease. Situated apart from the hospital proper is the power house with the laundries, which are separate for staff and patients, and steam and formaldehyde sterilizing plants; steam heating, electric lighting, and mechanical ventilation, need scarcely be mentioned as adjuncts of so modern a hospital. We feel grateful that so much has at last been done, and when the hospital is built and opened, we shall congratulate from our very hearts not only the movers in this matter, not only the contributors to its funds, but everyone who may come within its sphere of influence, even in the capacity of patient.

THE HARVARD CANCER COMMISSION.

The third report of the Caroline Brewer Croft Cancer Commission of Harvard Medical School, fills a number of the *Journal of Medical Research*, and consists of four papers, three of which have very practical bearing upon the investigations of cancer. Greenough, speaking of the cell inclusions of cancer, points out that they are a product of gland cancers, not of epitheliomata or sarcomata, and that they are really vacuoles which are connected with cell secretion; similar vacuoles are found in some non-cancerous diseases of the mammary gland; and, if the gland lumen be lost, as occurs in cancer, these secretion vacuoles cannot escape and they still further degenerate; finally the author once more reiterates that no reason exists for the interpretation of these appearances as of parasitic origin.

Vose and Howe have examined the effects of the Röntgen Ray upon cancer, and state that it causes a degeneration not histologically distinct from degenerations from other causes, and that the only cure by the X-Ray is by destruction and exfoliation, which limits its value to superficial cases; they consider that the destructive process is too slow, and that, the rays being non-selective, they cannot be used strongly enough to effect destruction of any but the shallowest tumors. If the rays be used so strongly as to destroy deep-lying cancer, they will cause burns which probably will never heal.

The third paper is by Nichols, upon Tissue and its Relation to Cancer; he points out that epidermal transplantation occurs, but never glandular; that the foetal tissues have greater potentialities of growth than have the

adult, that no transplanted issues infiltrate or form metastases, than connective tissues, such as foetal cartilage, can also be transplanted, and that when the tissue is transplanted, it does not reproduce the stage of development it had when transplanted, but goes on to its ultimate development, as it would have done if never removed. In all the conclusions of the three papers there are many points which are not at all new, but restatement of an old fact from a slightly different standpoint, is useful, and the Harvard Commission is doing its brave share of the work of the cancer problem.

THE TUBERCULOSIS ASSOCIATION.

The annual meeting of the Dominion Association for the Prevention of Tuberculosis, was held at Ottawa on March 15th, under the patronage of His Excellency the Governor-General, Senator Edwards being in the chair. The annual address was delivered by Professor Adami of Montreal, upon "Adaptation and Tuberculosis;" it was a thoughtful paper, and a thought compelling one in many ways, and will appear in the columns of this JOURNAL. Professor Adami in concluding, strongly urged the beginning of a campaign against the disease in cattle on Prince Edward Island, where absolute segregation and inspection is possible at a moderate cost, with the application of this procedure later to the entire country, a province at a time; certainly it would seem that effectual means in one part would far outweigh ineffectual means in all parts, if we are looking to the time when the disease will be completely eradicated.

A very encouraging feature of the meeting was the speech of Earl Grey, who delivered an address which was marked by a degree of enthusiasm and chiefly by a depth of knowledge of the subject which was, to speak frankly, a great and pleasant surprise to his auditors. His Majesty's representative is not at all times expected to have a thorough knowledge of the technicalities of such subjects as this, but evidently Earl Grey has appreciated the importance of the disease to the interests of the country, and has given careful study to the question. A general impression existed at the meeting that the House had done well to support the motion of Mr. Perley (Argenteuil), that the time had arrived for the Dominion Government to take action, in some way to assist the fight against tuberculosis; the Dominion is perhaps prevented by law from building sanatoria of its own, but it can at least assist provincial efforts in this direction, and even institute other methods in parallel lines.

We extend our heartiest congratulations to Professor Adami on the occasion of his election to be a Fellow of the Royal Society, and his thereby reaching a well-recognized milestone on the road to scientific fame. It is admitted that this title is a recognition of a definite and high position in the world of science, and it is a title, too, that is essentially an individual one, so that while we congratulate the university, it is with the full recognition that this honor has fallen to Professor Adami by virtue of merit, and is the product of his own energy. We believe we are correct in saying that Dr. Bell of Ottawa, is the only other Fellow of the Royal Society in Canada, who has a medical degree; and in view of the small number of Fellowships granted in medicine, and the great number of famous physicians and physiologists, we feel that this distinction is an unusually high one.

A well-merited honor was bestowed by the Governors of McGill University, in raising to the position of Professor Emeritus, Dr. Duncan McEachran, who was for many years professor of veterinary medicine and surgery, and dean in the faculty of comparative medicine and veterinary science. Apart from long, painstaking and zealous service to the university, Dr. McEachran's position in the veterinary world of Canada has been among the highest, and his services to the Government in the matter of cattle inspection and the prevention of disease, are too well known to require mention. Dr. McEachran has been a Fellow of the Royal College of Veterinary Surgeons of England for thirty years, and we wish him as long an enjoyment of his last honor.

Dr. Hunter, in the March number of the *Canadian Journal of Medicine and Surgery*, makes the following statement: We cannot look to our medical press, either, for effective work in a crisis. It is under a blighting influence, too, though not the same as that which emasculates the Medical Council. Through the niggardliness or indifference of the great mass of medical men, the medical press is not properly supported, and therefore it has to depend on the advertising columns of the big proprietary medicine houses. For a potent medical press, we must look to the profession at large for substantial support, as well as for a free expression of its opinion." This view of Dr. Hunter, we take the liberty of saying is erroneous, and arises from a shortness of vision which does not extend beyond his local environment.

The following item suggests that an orchestra may be in future a part of every operating room: "The strangest use to which music can

be put is to stop the flow of blood from a wound. An army doctor noticed that when a wounded soldier was taken to within an easy hearing distance from music, hæmorrhage was greatly relieved. . . . It is now believed that the vibration of the air produced by the music causes the patient to become faint. . . ." It is probable that this occurred in Germany, if ones own experience of the German band be allowed as evidence.

The University of Paris has established a new department for the dissemination of practical and scientific knowledge. At first sight this seems a large matter, but it is, in reality, an office to give information regarding college courses and hospital clinics to outsiders desirous of using the facilities of the university.

The necessity for medical inspection of schools is shown by the fact that in one year five and a half per cent. of the children examined in New York were excluded, while a slightly higher percentage was rejected at Chicago in the same period.

Dr. Hyde, of Chicago, in the March number of the *American Journal of Medical Sciences*, blames the St. Louis Fair for an increasing prevalence of the itch. The directors probably failed to think of this in time.

On March 17th, Manuel Garcia celebrated his 100th anniversary, and through Dr. H. S. Birkett, the congratulations of McGill University were sent to him on the happy occasion.

THE RESIGNATION OF DEAN CAMPBELL.

It is with much regret that we learn of the resignation of Dr. Francis Wayland Campbell as Dean of the Medical Faculty of Bishop's College, owing to ill health.

The history of Dr. Campbell's connexion with Bishop's College takes us back to the birth of the Faculty in March, 1871, when he was appointed the first Registrar of the Faculty, and Professor of the Institutes of Medicine. Five of the twelve original members composing the Faculty are alive and are to-day enjoying lucrative practices and standing high in the profession in Montreal. Dr. Campbell filled the chair of physiology for ten years and on the death of Dr. David, the first Dean of the Faculty, in 1883, he was elected Professor of Medicine and Dean of the Faculty, and well and faithfully has he served his University in this

capacity. Quick in grasping the details of a problem, logical in argument, prompt and business-like in all appointments, and combining great foresight and optimism, he has been a strength to the school. A practical man himself in all things, it is natural that the school should excel in practical teaching, and this has always been the attractive feature in the course at Bishop's College.

At the inception of the Faculty, Dr. Campbell with the other professors received the degree of M.A., *honoris causa*, from the University at Lennoxville, and in 1895 he was honored with the degree of D.C.L.

Many practitioners will remember Dr. Campbell best as Secretary of the College of Physicians and Surgeons of the Province of Quebec, which post he held for ten years; and many of these practitioners are grateful in pointing to him as the one whose wise councils enabled them to propitiate the conflicting laws and regulations barring applicants from admission to the practice of medicine in the Province of Quebec.

Medical journalism always proved attractive to Dr. Campbell. He was one of the editors of the *Canada Medical Journal* from 1864 to 1872, when he established the *Canada Medical Record* and remained its editor for many years.

Dr. Campbell is an enthusiast in all matters military. For over 43 years he was actively connected with the Militia of Canada, rising from private to the rank of Surgeon-Lieut.-Colonel, the highest rank obtainable. The *Montreal Gazette*, of December 10th, 1898, in giving notice of his retirement, well said that "the history of Dr. Campbell's career is the history, one might say, of the local militia. There have been few if any events of interest that have occurred to the soldiers of Montreal in which he has not played a prominent part, and one can only view his retirement with extreme regret."

And so it is with the history of Bishop's College. The history of Dr. Campbell's energy and effort is the history of the success of the Medical Faculty of Bishop's College; and gratifying it must be to him to look about in the field of medical learning and note the height to which many of his old students have attained, and recall the days when they sat before him.

We are sure that many a graduate abroad and at home will sympathize with the Faculty in their loss, and will hope that the rest and relaxation from his long-present burden of leadership will restore to him that health and well-being so faithfully and so richly earned.



DR. FRANCIS WAYLAND CAMPBELL,
Dean of the Medical Faculty of Bishop's College.

Reviews and Notices of Books.

DISEASES OF THE LIVER, GALL BLADDER AND BILE DUCTS.—By H. D. ROLLESTON, M.A., M.D., (Cantab) F.R.C.P., Physician to St. George's Hospital, London, Philadelphia, New York, London. W. B. Saunders & Co., 1905. J. A. Carveth Co., Toronto.

Although differing in method of approach and treatment of the subject, this volume of Dr. Rolleston's is assured of taking the position as the standard authoritative work of reference in our language on the subject of the liver and its diseases, held for so many years by Murchison. The times are changed, and whereas Murchison in the sixties could with advantage, largely base his presentation of the subject upon personal experience, since then so detailed has been the study of individual conditions of disease, so wide a field has been opened for observation and experiment, that to-day no one man can pretend by personal observation to cover a tithe of the ground. To compress all the necessary matter into the limits of a single volume there can be no leisurely writing about and around each condition discussed: the treatment has to be direct, the abundant work of other observers has to be duly recorded, and success or failure depends on the way in which the work of others is abstracted, balanced and sifted, and given its proper place and value. When we recognize the conscientious way in which Rolleston has performed this part of his task, and observe the results obtained, we are not surprised that the volume is the outcome of no less than twelve years of steady work. By this we do not mean to indicate that the work is in any sense a mere compilation; on the contrary almost every page shows the fruit of the author's own experience, by his constant reference to cases seen and studied at St. George's; the treatment is individual to a very high degree; but the value of the work lies almost equally in the honest presentation of the other results of other observers. As Dr. Rolleston states in his introduction, the literature of the subject is enormous, and though he has omitted to insert full bibliographies at the end of each chapter, the reference to individual articles consulted and quoted, given at the foot of each page, must upon rough calculation be considerably over three thousand. There must of course, be omissions—an occasional valuable paper must be overlooked; that by Palmer Howard on Cirrhosis in Children is not mentioned, though it may be said to be included in Musser's later work; but how thorough the study has been may be suggested by the statement that we have counted no less than fifty-eight reference to work emanating from Canada—to the writings of Graham and McPhedran from Toronto, of Lafleur, Ross, Osler (before he migrated), Adami, Nicholls, M. E. Abbott, Ford, Gillies and Klotz from

Montreal, not a little of which has appeared in the pages of this JOURNAL. Justice we are glad to note has also been done to the French literature on the subject. For long years French workers have paid special attention to the liver, and have been indeed pioneers in certain directions, and as their results do not in general receive adequate attention in the German writings, to which hitherto we have been accustomed to turn for fuller study, it is well that they are here treated with the respect they deserve. Italian literature has also contributed its due quota. We would only add that written as the work is by a physician, no attempt is made to discuss the surgery of the liver and bile passage although the surgeon will find that the etiology and symptomology of the conditions which must interest him: cholelithiasis, cholecystitis, hepatic abscess, etc., come in for thorough treatment.

The various forms of cirrhosis are discussed with great care. We have here, in short, the best and fullest study of these conditions with which we are acquainted in any language. Next to this the condition of jaundice and of hepatic tumours are the most important sections, and the syphilitic affections of the organ are treated in a masterly manner.

The only section that appears to us unsatisfactory is that on the fatty liver. It is true that Rosenfeld's observations upon the nature of "fatty degeneration," so called, have severely shaken up the old accepted views regarding this form of fatty liver. We think, nevertheless, that it would have been well to differentiate more clearly than has been done between the almost physiological infiltration of the healthy cell, the cell, that is, with deeply staining and healthy looking nucleus, and the degenerative infiltration, in which the nuclear change alone is sufficient to indicate that the cell is greatly damaged. Dr. Rolleston's difficulty appears to arise from doubt as to where to place the alcoholic and tuberculous fatty livers. While, as in chloroform poisoning, there may in acute alcoholism be developed a true "fatty degeneration," closely resembling that seen in phosphorus poisoning—i.e., the cells containing a mass of fat droplets of various sizes, some distinctly large—in ordinary chronic alcoholism the condition is one of pure fatty infiltration. We have no satisfactory indications, that is, that in small amounts, alcohol acts as a protoplasmic poison to the liver, although it obviously does so in large amounts; the appearance in chronic alcoholism are merely those of excessive storage of fat. In tuberculosis,—though here we speak with more diffidence,—the same would seem to be true. Judging by the nuclei the liver cells are not in a degenerative condition. We must suppose that, as in starvation, the tissues in general, undergoing emaciation, give up their fat, which then is found in increased amounts in the

blood (Schlutz) and so passes to the liver; so the progressive emaciation characteristic of tuberculosis leads to a giving up of these fats by the other tissues with resultant storage of the same in the liver.

With so much that is still debatable it is natural and inevitable that while welcoming and appreciating Dr. Rolleston's work we find ourselves here and there at loggerheads with him. The interesting fact is that so far in almost every case in which we differ, the author appears to have foreseen our point of view and to have supplied arguments—and in general strong arguments—in favour of his contention. Thus to take more particularly work emanating from Montreal he evidently accepts grudgingly the existence of obstructive biliary cirrhosis. He points out that no less than seven of Ford's series of cases are those of congenital obliteration of the common bile duct, and as regards these he accepts Thomson's view that the obliteration is secondary to a descending cholangitis, and it is to this, rather than to the obstruction *per se*, that he would ascribe the cirrhosis. He points out further that the frequent enlarged spleen in these cases indicates also that an infective condition is the essential feature. We are compelled to agree with him very largely. And yet on further consideration we would ask, what is the cause of the jaundice in all cases of cholangitis if not a coincident obstruction of the bile passages? We are of opinion that in all cases of obstruction, whether infective, or not, there is, through pressure in the bile passages a resorption of the already excreted bile and that it is this resorbed bile which, in extreme cases, causes actual necrosis of the liver cells and, in milder cases, sets up an irritation around the bile ducts leading to the overgrowth of connective tissue and biliary cirrhosis. The condition, we would urge, is parallel to what has been experimentally determined in the pancreas; there a moderate grade of obstruction leads to fibrosis around the ducts, a severe grade of necrosis.

Dr. Nicholl's work on hyaloseritis is given a full acknowledgment without the term hyaloseritis being ever employed. We have learnt, from other sources, that Rolleston regards this as a barbarous term, and we freely admit that it is a hybrid; nevertheless, we believe that it has come to stay—it is already taken up by German writers—and that for a reason which Dr. Rolleston's treatment of the subject itself demonstrates. That word will be accepted which best expresses a given idea, and if no word of true Greek parentage will express that idea then a snappy mongrel is better than a blue-blooded circumlocution. After all the first virtue of a word is its utility, the second its parentage. We may deplore the parentage of "appendicitis" for example, but no compound of wholly Greek origin effectually supplies its place. And so we would

point out that "universal chronic perihepatitis," as Rolleston would term what Curschmann first denominated "Zuckergussleber," is most inadequate. The chronic hyaline perihepatitis is only one manifestation of a general condition which affects not merely the liver but other portions of the peritoneal serosa, and frequently the pleuræ and the pericardium as well. A word is needed to express at once the fact that this process is liable to affect serous membranes in general and that the deposit has a characteristic hyaline appearance, and 'hyaloserositis' exactly fulfils the want.

One last note, which may seem almost ungracious, considering the prominent position given to our own classification of the cirrhoses and it is this, that, in affording that classification we expressly pointed out the very fact which Rolleston brings against it, namely, that several of the subdivisions are of no clinical importance, and even histologically are rare and of slight extent; so we concluded, with him, that for practical purposes, portal biliary and the pericellular cirrhosis of (most often congenital) syphilis are the forms that alone deserve detailed consideration.

That these are the severest strictures we are able to bring against the work is, we think, sufficient indication of its high standing.

J. G. A.

THE SURGERY OF THE DISEASES OF THE APPENDIX VERMIFORMIS AND THEIR COMPLICATIONS, by WILLIAM HENRY BATTLE, F.R.C.S., and E. M. CORNER, M.B., B.Sc.—Chicago, W. T. Keener & Co., 1905, pp. 208.

This is a modest work compared with some others on the same subject, and yet it treats of (as well as the pure inflammatory conditions of the appendix) carcinoma, tubercular and other diseases of this troublesome organ, and the relation of appendicitis to life insurance. Anything Mr. Battle has to do with is well done, and this work is no exception to the rule. First, we have the history of the disease and its surgical treatment, with a clear account of its anatomy, macroscopical and microscopical. The authors state that the appendix is not functionless, but that the fluid secreted by it has some influence on digestion, that it is not an organ undergoing degeneration but is a specialised part of the intestinal canal, containing lymphoid tissue. However this may be, and Sir Wm. Macewen holds much the same views, we can do very well without it, and it cannot be denied that as age advances it becomes more atrophied, and in a certain percentage there is a tendency to obliteration. Certainly, judging from comparative anatomy, the appendix in man ceases to grow *pari passu* with the cæcum itself, and the transition from

the cæcum to the appendix differs very much in this respect from such animals as the beaver, and the porcupine where there is an enormous prolongation of the cæcum beyond the ileo-cæcal valve. In carnivora the cæcum is small and there is no appearance of its prolongation. The pathology, etiology, and bacteriology of the appendix is dwelt on, and those non-suppurative, acute and chronic forms take up a chapter. The various methods of removal are described and the one advocated by the authors, which they say originated in St. Thomas' Hospital, is that of incising the superficial structures down to the rectus muscle on the right side, incision of the sheath and temporary displacement of the rectus. The various methods of removal of the appendix are alluded to, but the favourite one of the author's is clamping the organ at its base, ligating the compressed part, and cutting away with scissors, and then the stump is buried in the cæcum. This is described as the quickest, neatest and most aseptic method of removing the appendix. We have operated for years, and have tried every method except the clamp, which seems to us particularly European. The method which is the simplest gives the best results, and the quickest is the old one of ligating near the base, cutting off with scissors and cauterizing. The ligature destroys the inner coats quite as well as the clamp, and experience shows that the results are as good as by any other method. In diffuse peritonitis the pus is evacuated, the appendix removed and the abdomen flushed with saline, adequate drainage is provided and salines injected into the veins. The complications, such as diaphragmatic abscess, faecal fistulae, hernia, obstruction, etc., are shortly but well considered, as is also the bearing of this disease to life insurance. If the patient has had a recent attack, an extra premium should be demanded; if several attacks have been experienced, then a period of two years must elapse, after operation in the interval six months; after operation in a suppurative case, two or three years. We have read this book with profit and interest, and can heartily recommend it as a safe and trustworthy guide in this disease. American authorities are freely quoted, and full credit is given to the surgeons of the United States for their pioneer work.

LATERAL CURVATURE OF THE SPINE, AND PELVIC DEVIATIONS. By Richard Barwell, F.R.C.S., sixth edition; London, Baillière, Tindall & Cox; 1905. Canadian Agents, H. A. Carveth & Co., and Chandler and Massey, Toronto.

Although a sixth edition, this is an entirely re-written volume, and it is evidently the work of a man with a hobby; this is not to say that it is not a good book, for the hundred pages into which it is condensed

cannot be read without seeing that Mr. Barwell has compressed the results of a great labour into very small space, nor can it be read without seeing that the author has a most fervent belief in what he says, and that the whole book has come out of his own thought and experience. These points all warrant the most careful reading. The author indulges in no theoretical discussions, describes no pathology, and begins and ends with what a careful observer can see and feel from the outside of the patient. He uses photography to its fullest extent in his diagnosis of the case, and obtains a full length photograph of the back and legs of a patient who stands, in a fixed position with reference to the upright and the horizontal planes, upon a measured line on the examining room floor. The result is that with a square, the deformity can be demonstrated on the photograph, and one's impression from reading the book and observing the many plates, is that Mr. Barwell has a very correct method of preliminary examination. In treatment, the author quarrels with many of the older more or less recognized modes, and he is the avowed enemy of all the complicated harness that does seem so irrational from the standpoint of everyone but the instrument maker. With regard to extension for crooked spines, he particularly asks "When you wish to straighten a bent shaft do you do it by pulling at both ends?" In three chapters, devoted to treatment of pelvic deviations and lumbar and dorsal curves, the author advises a minimum of apparatus, and of the simplest, while he depends upon the patients' co-operation in a habit of correct posture, by education of muscles, the whole being constantly subjected to the law of the plumb line.

TEXT-BOOK OF INSANITY BASED ON CLINICAL OBSERVATIONS.—FOR Practitioners and Students of Medicine. By DR. R. VON KRAFFT-EBING, late Professor of Psychiatry and Nervous Diseases in the University of Vienna. Authorized translation from the latest German edition by Charles Gilbert Chaddock, M.D., Professor of Diseases of the Nervous System in the Marion-Sims-Beaumont College of Medicine, Medical Department of St. Louis University, St. Louis, Mo., etc. With an introduction by Frederick Peterson, M.D., President of the New York State Commission in Lunacy. Pages xvi-638. Royal Octavo. Price, extra cloth, \$4.00, net; half-russia, \$5.00 net. F. A. Davis Company, Publishers, 1914-16 Cherry Street, Philadelphia.

Professor Krafft-Ebing was well known as one of Germany's most distinguished alienists, which fact, combined with his acknowledged skill as a writer, is a guarantee for the merit of the book now before us.

Probably no one had a richer clinical field in the department of psychiatry than the author, during his experience of thirty-three years spent in teaching and in the observation of the insane. His work has been the recognized clinical text book for many years in most of the Continental universities, but now for the first time makes its appearance in English, thanks to Dr. C. G. Chaddock, who has furnished us with a really admirable translation.

Dr. Krafft-Ebing in his text-book has given us essentially the views of German alienists, and has made his exposition of psychology and psychopathology especially clear and prominent. The work is divided into three books, each of which is again sub-divided into several parts, the whole forming a compendium of almost all that is known in a still obscure field of general medicine. Book I, is an introduction to the study of psychiatry; book II, treats of the general pathology and therapy of insanity; and book III, deals with the special pathology and therapy of mental diseases. The portions of book II, relating to the anomalies of the emotional, intellectual and motor sides of mental life are especially valuable, while the chapter on paranoia, in part III, is one of the best and most lucid expositions of this interesting and very important disorder that we have yet seen. The cases recorded are aptly selected, well depicted and form a meritorious adjunct to the letter press proper. As might be expected from the author of "Psychopathia Sexualis," considerable, and to our mind, undue stress is laid on morbid erotic manifestations as symptomatic of mental disturbance.

Taken as a whole the work is an important addition to the literature of this subject. For the purposes of the student there are books, such as those of Clouston, Blandford, Brower and Bannister, or Peterson, which will always be more popular; but for the specialist and the general practitioner, who takes more than a passing interest in the subject of psychiatry, Krafft-Ebing's book will be found extremely useful and instructive.

T. J. W. B.

PATHOLOGICAL REPORTS, Montreal General Hospital, No. IV. Reference index of post mortems, from 1st January 1896 to 31st December, 1902, pp. 213. Compiled by John McCrae, B.A., M.B., assisted by Oskar Klotz, M.B., and W. G. Ricker, B.A., M.D.

This is a continuation of No. III., of the series, which was compiled by the late Dr. Wyatt Johnston and published by the General Hospital in 1896. With the present publication, there is available the outlines of 2,037 autopsies, in which each condition mentioned in the anatomical diagnosis is indexed, so that the frequency of any condition, and the

cases in which it has occurred can be found with very little trouble; thus the excellent pathological material of the hospital is made available, as far as possible, to outside enquirers.

One notices in the index that tuberculosis of the lungs and cases of general miliary tuberculosis together total 445 cases, that is, about 21 per cent. of the whole number. The index of lobar pneumonia shows about 150 cases, and that of broncho-pneumonia about 200 cases, the latter doubtless being frequently part of a terminal infection. That part of the index which refers to endocarditis is divided so as to indicate the relative frequency with which single valves or groups of valves are affected, and conveys, some useful information even on the most casual inspection.

The Montreal General Hospital is to be congratulated upon the spirit indicated by the publication of such material, even at considerable expense; a hospital increases its usefulness in a scientific sense whenever its material becomes thus available, in however slight a degree, to those outside its own walls.

PROGRESSIVE MEDICINE, Edited by HOBART AMORY HARE, M.D., assisted by H. R. M. Landis, M.D., March, 1905. Lea Brothers and Company, Philadelphia and New York.

The contents and writers of this volume are: Surgery of the Head, Neck and Thorax, by Charles H. Frazier, M.D.; Infectious Diseases, Including Acute Rheumatism, Pneumonia, and Influenza, by Robert B. Preble, M.D.; The Diseases of Children, by Floyd M. Crandall, M.D.; Laryngology and Rhinology, By Charles P. Grayson, M.D.; Otology, by Robert L. Randolph, M.D. This Number makes a volume of 300 pages, and contains the best which has been learned, upon the subjects with which it deals, in recent months. The literature has been carefully scrutinized, and especial credit is given to New York and German Journals. A book of this nature is essential for any physician who would keep in complete touch with his profession, and there is none better than Progressive Medicine. The March issue creates a particularly favourable impression.

THE MEDICAL EXAMINATION FOR LIFE INSURANCE.—By CHARLES LYMAN GREENE, M.D., St. Paul. Second edition revised and enlarged, with 99 illustrations, 466 pages. Price \$4.00. Philadelphia, P. Blakiston's Son & Co., 1905.

This is the best book which we know upon life insurance. It is at once philosophical and technical, complete and well arranged. The

historical account of life insurance is full of interest. There is entire appreciation of all the problems which the medical examiner and director has to solve. The statistical information is most useful, and covers nearly every aspect of the underwriting of lives. The insurance of sub-standard risks is dealt with wisely, and with a full apprehension of the difficulties which lie in the way of a just arrangement of premiums. The balance of the book is not improved by the recital of cases of attempted fraud; and it is time to leave the casting of stones at Oscar Wilde to the vulgar. The present reviewer has read the whole book—tables and all—with interest and profit.

THE OPHTHALMIC YEAR-BOOK.—A digest of the Literature of Ophthalmology, with index of publications for the year 1903; by Edward Jackson, A.M., M.D. The Herrick Book and Stationery Co., Denver, Colorado, U.S.

This is a book of 250 pages that condenses the current literature of the year into a form in which it is available for the ophthalmic surgeon, given in sufficient detail to make the material applicable in practice. It is not possible to notice in detail material of so wide a scope; the index appears to be a very useful one, and by means of it, and the alphabetical list of authors given in the appendix, it is possible to place any known reference with which the book deals; this will be admitted by all who deal with scientific literature, to be no small virtue. We notice reference to articles upon "Skin Grafting in Ophthalmic Surgery," by F. Buller, M.D., and "Gumma of the Ciliary Body," by F. Tooke, M.D., of Montreal.

THE SURGICAL DISEASES OF THE GENITO-URINARY TRACT. VENEREAL AND SEXUAL DISEASES.—By FRANK LYDSTON, M.D., Professor of the diseases of the Genito-Urinary Organs and Syphilology in the Medical Department of the State University of Illinois. Revised edition, illustrated with 233 engravings and seven colored plates. Philadelphia. F. A. Davis Company, Publishers, October, 1904.

The first edition was published in September, 1899, since when no very striking advances have been made in genito-urinary surgery. The organic salts of silver have come to be very generally used in the treatment of gonorrhœa. The methods of using these salts are fully detailed in the present edition. The book has been well received, and has taken a high rank. The illustrations in the present edition are numerous and of a better quality than in the previous. The book is to be commended as reliable and up to date.

Medical News.

DISTRICT OF ST. FRANCIS' MEDICAL ASSOCIATION.

The regular meeting of the District of St. Francis' Medical Association was held in Sherbrooke on March 8th. Dr. F. J. Austin, president, in the chair. There were present:—Drs. Camirand, Genest, MacKay, Byers, King, Smith, Bachand, Gadbois, Rioux, Lamy, Stevenson, Banfell and Williams. Drs. J. R. Byers (Sherbrooke), A. Pelletier (St. Famille), were elected members of the association. A committee composed of Drs. Austin and Camirand presented to the meeting the resolution, which had been forwarded to the Minister of Justice, dealing with the question of the indiscriminate sale of wood alcohol. Cases in practice were related by some of the members present.

Dr. Camirand reported a case of sarcoma of the brain, which had perforated the skull and spread out over the temporal and parietal bone beneath the scalp. The extracranial portion was six times larger than the intracranial, although there was a marked depression in the motor region of brain, there was an almost complete absence of pressure symptoms.

Dr. Smith reported a case of sudden death in a healthy girl, aet 17. Severe headache, general depression and finally stupor and death followed in rapid succession. The length of time from onset to the fatal termination was only six hours. No cerebral symptoms, outside of stupor, were present. Rupture of cerebral artery at the base of the brain was the diagnosis. No autopsy could be obtained.

Dr. Bachand presented patients upon whom he had performed a modified operation for mastoid disease, with good results in each case.

Dr. Williams reported a case of a large cystic tumour in a child 12 days old. It was situated on the left side of neck and extended from the tip of the mastoid to the clavicle, and was the size of a small orange. The growth was removed under chloroform narcosis.

Dr. Byers read a paper on "Relative Aortic Insufficiency."

ROYAL VICTORIA HOSPITAL.

Report for month of February, 1905:—Patients admitted, 214; discharged, 207; died, 11; medical, 59; surgical, 96; ophthalmological, 23; gynaecological, 28; laryngological, 9. Out door department:—Medical, 612; Surgical, 332; ophthalmological, 348; gynaecological, 67; laryngological, 386. Total, 1,745. Ambulance calls, 62.

NOTRE DAME HOSPITAL.

Admitted during February, 1905:—172 patients. Discharged, 167.

In the various out door departments 1,760 patients were treated. The ambulance responded to 64 calls, 41 of which were for accidents and 23 private.

HOTEL DIEU.

Were treated during month ending February 28th, 1905:—263 male and 192 female patients. Discharged, 128 male and 91 female patients. Died, 9 male and 4 female patients.

Coroners of the Province of Quebec met in Quebec on February 22nd, and formed the Association of Coroners of the Province of Quebec. The following officers were elected:—President—Coroner G. W. Jolicœur, Quebec. Vice-President—Coroner Bachand, Sherbrooke. Secretary-Treasurer—Coroner Triganne, Plessisville. Executive committee—Coroners Gauthier, Upton; Vallincourt, St. Anselme; Chevalier, Iberville.

The meeting was presided over by Coroner McMahon, of Montreal.

Dr. David G. Thompson, of Hamilton, died on February 19th, in the 41st year of his age. He was a graduate of Trinity Medical College.

Dr. N. Agnew died on March 18th, 1905, in St. Paul, in the 77th year of his age. Dr. Agnew practised in Brandon since 1886, and before that in Winnipeg for eight years.

Dr. Elisha D. Roach, of Tatamagouche, died February 9th, 1905, at an advanced age. He was a graduate of the University of Pennsylvania, and practised medicine for 40 years.

Dr. J. A. Greig, formerly of Kincardine, Ontario, Winnipeg, and North Dakota, died in Washington of tuberculosis. He was a member of the first graduating class of the Manitoba Medical College.

Dr. Philip Chisholm, the oldest resident of Cape Breton, died on March 11th. Dr. Chisholm was born at Loch Charron, Rosshire, Scotland, 102 years ago last June, and came to Nova Scotia in 1821.

Dr. M. H. Brophy, of Quebec, died on February 24th, in the 45th year of his age. He was a graduate of Laval, and a member of the College of Physicians and Surgeons, and Bacteriologist to the Government vaccine farm.

Work is to be commenced on the new hospital, founded by Mgr. Guay, at St. Joseph de Levis, about the first of April. The building is to have a frontage of one hundred feet by sixty feet deep, and will have three stories. It will be built of stone and brick.

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF GEORGE E. ARMSTRONG.

J. BENTLEY SQUIER, M.D. "Observations on Twenty-eight Cases of Prostatectomy." *Medical News*, February 18, 1905.

The writer favours the perineal route and the vertical median incision. The advantages claimed for this method are low mortality, completeness of result, openness to visual dissection. In answer to the advantages secured by adopting the suprapubic route, the removal of a calculus and an enlarged middle lobe, the writer holds that if the calculus be too large to be removed through the perineal wound a suprapubic could be done and dependent drainage secured, while for the enlarged middle lobe it is often largely a question of manual dexterity on the part of the operator. Prostatic hypertrophy is not regarded as a senile condition, but as an interstitial change which has been insidious in its onset, first affecting the innervation of the gland and its enclosed urethra, giving rise through its close connection with the hypogastric plexus of the sympathetic nerves to many reflex symptoms in the kidney and bladder, as well as those of a purely sexual character, and eventually, with the declining vigour of the patient's later years, becoming a mechanical obstruction to the outlet of an already overworked bladder. A proof of this view five cases are under observation where ages range from 23 to 40, in all of whom the gland is twice its normal size. They now suffer from faulty innervation of the organ only. That the time will come when such patients will be offered the radical operation for relief before the symptom of obstruction has set in, the writer firmly believes.

In seven cases the prostate was removed by suprapubic incision with perineal drainage. Of these three died, one from hemorrhage and two from uremia. One lived a year and a half. The other remaining cases were ideal cures. Of the 21 cases of perineal prostatectomy there have been two deaths from uremia. As to the possibility of removing the prostate gland, leaving the ejaculatory ducts patent, the writer believes that if such does happen it is more the result of good luck than good management. In connexion with injury to the ejaculatory ducts, attention is drawn to postoperative epididymitis, which occurred in seven cases, usually on the ninth or tenth day. Some cases ran an extremely acute course, and one ended in suppuration. To prevent this complication, ligation of the vasa deferentia prior to the prostatectomy is suggested. If the vertical incision be used the perineal tube and gauze

can be removed much earlier than when a more extensive incision is employed. They are generally removed in from 24 to 48 hours. Stress is laid upon the necessity for their removal. Three of the cases had a marked degree of pyelitis, but with the removal of the obstructing gland the condition was greatly improved. The majority of the cases call for treatment, directed towards the accompanying cystitis and loss of muscular tone of the bladder wall. Seventy-five per cent. of the cases had more or less advanced renal lesions, and it was observed, that in many cases of renal insufficiency the condition was much improved by removing the urinary obstruction and so giving free drainage to both kidney and bladder.

T. C. LITLER JONES, F.R.C.S. Eng. "A Case of Acute Hæmorrhagic Pancreatitis, Operation, Recovery." *Lancet*, February 18th, 1905.

The points of interest in this case apart from its rarity, are the age of the patient (26 years), the extremely foul and furred tongue, the absence of any known cause, the difficulty in diagnosis and the uncertainty of treatment. With the exception of a history of constipation the woman was in perfect health. While turning in bed to reach for her baby she was taken with a sudden severe pain in the abdomen. Though constipated she at once passed a small hard stool. The pain was accompanied with vomiting more or less persistent. Numerous enemata failed to obtain any result more than a little flatus. She was admitted 46 hours from onset of attack. An anxious expression, dry mouth and foul furred tongue, distended abdomen, fluid in the flanks, painful area in the epigastrium with localized swelling, pulse 128, weak and fluttering, temperature 96 F. was the clinical picture. A tentative diagnosis of perforated gastric ulcer was made. Upon opening the abdomen about three pints of blood mixed with serum escaped. Exploration revealed fat necrosis at the entrance to the lesser sac of peritoneum, an opening was made through the gastrocolic omentum and the pancreas found to be about three times its normal size, discolored, oedematous, and in places hæmorrhagic, though no free bleeding was present. The gland was incised longitudinally. No stone or abscess was found, but what seemed to be a dilated space, which was packed with gauze. Wound closed with the gauze for drainage. The packing was removed in 36 hours, when a discharge of clear, fluid pancreatic juice, began, causing trouble at the upper end of wound. The case was discharged perfectly well about two months later.

WILLIAM J. MAYO, M.D., and CHARLES H. MAYO, M.D. "A Review of One Thousand Operations for Gall Stone Disease, With Special Reference to the Mortality."

The writers have taken the layman's point of view, that if a patient goes into a hospital alive and dies there, the death resulted from the operation. On such a basis the mortality attending an operation must necessarily be greater than when regarded as due directly to the operation, but it serves to remind us of the great importance which complications play against the recovery of our cases. The paper, as stated, is devoted for the most part to mortality statistics, and one cannot but regret the absence of conclusions which, drawn from so many cases, would add to our knowledge of gall stone disease and its surgical treatment.

GEORGE EMERSON BREWER, M. D. "A Report of Eighty-Four Operations on the Kidney and Ureter." *Medical Record*, February 18th, 1905.

Of the 84 operations there were 27 nephrotomies, with eight deaths; 57 nephrectomies with one death; nine nephrorrhaphies with no mortality; ten decapsulations on five patients with two deaths, five operations on the pelvic portions of the ureter without a death, six emergency operations on traumatic cases with one death. The various pathological conditions requiring these different operations are reported and many of the cases are of unusual interest. Six cases of multiple septic infarcts are reported, the condition being limited to only one kidney, generally the right. Four had a nephrotomy performed and were fatal, while in two cases a nephrectomy gave recovery. With reference to calculus, in which class more errors are made than in any other renal condition, the writer takes up the various symptoms and methods of examination, that should enable us to make a correct diagnosis. His conclusion may be given as follows: While pain and tenderness were present in 100 per cent. of cases of stone it must not be forgotten that they were also present in a large percentage of cases in which no stone was found. That calculus may exist without pain was shown by Bruce Clark who performed 24 autopsies on calculus cases, in thirteen of which there had been no subjective symptoms during life. Hæmaturia was present in 52 per cent. of calculus cases and in 45 per cent. of cases without stone. Spontaneous hæmorrhage during rest or sleep generally means new growth, while hæmorrhage following exercise is strongly indicative of stone. Frequent or painful micturition was present in one

half of the cases of stone. Vomiting was found to be a very constant accompaniment of severe colic, but was present in a greater percentage of cases where no stone was found. Fever is rarely a symptom of uncomplicated stone, mild and moderately severe cases of calculous pyelitis often running a normal temperature, while the ureter remains patent, but will show an immediate rise if the ureter becomes occluded. Cystoscopy helped to a correct diagnosis in 66 $\frac{2}{3}$ per cent., and was misleading in 33 $\frac{1}{3}$. Ureteral catheterization proved valuable in definitely determining the side of the lesion, and in establishing the competence of the opposite kidney. With reference to the X-rays, we should reject all plates which do not show the outline of the psoas muscle and transverse process of the lumbar vertebræ, and look with suspicion on all shadows which do not have well defined edges.

MEDICINE.

UNDER THE CHARGE OF JAMES STEWART, F. G. FINLEY, H. A. LAFLEUR AND
W. F. HAMILTON.

TYPHOID FEVER.

The subjects of interest which cluster about typhoid fever are at once both numerous and varied. The Widal test clears up certain doubtful and atypical cases. At the same time there is a group of cases in which, the decision has been made long before the agglutination test shows any sign of positiveness, not to speak of another group in which the reaction never comes throughout the whole course of the disease.

Rolly.—(*Münchener Med. Wochen.*, June 14th, 1904), pleads for an examination of the blood taken from one of the veins of the arm. He claims that even in the beginning of the illness, when agglutination and roseola are yet absent bacteriological examination of the blood is an invaluable aid to diagnosis, and leads usually to an early and definite result. Rolly describes a method of preserving the bacilli alive for 24 hours in a grape sugar medium with peptone, until it is placed in the hands of a bacteriologist. He describes also the methods of applying the Widal test with typhoid bacilli killed with toluol.

During the past two years, throughout Canada and the United States, ample opportunity for observing typhoid epidemics has been afforded those who practice medicine and especially students of sanitary science.

Dr. Stokes contributes a paper (Some typhoid epidemics studied by laboratory methods, *Journal of the Amer. Med. Assoc.*, February 25, 1905), describing several epidemics of typhoid fever—the sources of which were located by means of bacteriologic examinations.

In the first epidemic, a city numbering 12,000 people, had two sources of water supply and only that portion supplied from one source suffered. One street, the dividing line of the town, marked the line between the infected and the non-infected portions. A spring in a hollow supplied the various houses. Cleansing with formalin and disconnecting the spring from the service practically cleared the water of bacteria and the town of the disease.

Another epidemic of 61 cases in the round of one milkman was clearly traced to milk. The milkman's wife and son took typhoid fever and during the early part of their illness milked the cows. The well water was found contaminated with colon bacilli. An investigation of an outbreak of typhoid fever among the female employees in a factory, served to show that the milk was the cause. The men drank beer at their lunch, the women were served with milk from a dairyman just outside the city limits, and both women and men drank of the water supply in the factory. The water of the factory was free of colon bacilli, with only 450 bacteria per c.cm. The milk contained 4,500,000 per cubic centimeter and the colon bacillus was found in 1/1000 of a c.cm. There were no further complaints from this factory after the milk was discontinued.

Thayer has made a most careful study of the cardiac and vascular complications of typhoid fever.—(*Johns Hopkins' Bulletin*, October 1904.) The analysis includes 1,458 cases admitted to the Johns Hopkins' hospital from May, 1899, to January, 1904. The conclusions arrived at after a characteristically painstaking investigation are as follows:

1. Typhoid fever, clinically speaking, is often associated with symptoms suggestive of a great weakening of the heart muscles. A temporary insufficiency of the mitral valve results as indicated by an apical systolic murmur not infrequently transmitted to the axilla developing especially at the height of the disease; these murmurs usually disappear with convalescence. They may persist.

2. Endocarditis in typhoid fever is probably more frequent than is generally supposed. It was undoubtedly present in three cases out of 95 necropsy cases, while in three others it was suggested clinically.

3. Pericarditis is an unusual and an unimportant complication.

4. Phlebitis and venous thrombosis occurred in 2.6 per cent. of Dr. Thayer's cases.

5. Arteritis and arterial thrombosis is more frequent than is generally recognized, and is especially common in the central vessels.

6. A survey of our pathological material would suggest that typhoid

fever may be a not infrequent cause of focal arterio-schlerotic changes. This view finds support in the fact that in 21 out of 52 cases there were evidences of fresh endarteritis. In 13 out of 62 cases the coronary arteries were the seat of fresh endarteritis.

7. While the deleterious influence of typhoid fever upon the cardio-vascular system is not as great as that of acute rheumatism yet, through the unfortunate frequency of the disease in this country, it is probable that post-typhoidal cardio-vascular defects are not uncommon. It would be wise for the practising physician to bear this in mind and whenever possible to keep his typhoid patients under observation for several years following the disease.

Hydrotherapy in typhoid fever now embraces a more extensive use of water than is implied in the Brandt method of treatment. Cushing and Clarke have taken up the subject of copious water-drinking and polyuria in typhoid fever.—(*American Journal Med. Sciences*, February, 1905), and from observations of 100 cases draw the following conclusions:

1. Large quantities of water internally, a gallon or more in 24 hours, may easily be taken by typhoid fever patients, if administered in small quantities at frequent and definite intervals.

2. A copious elimination of watery urine at once follows, the degree of polyuria day by day closely corresponding to the quantities of fluid ingested.

3. Patients are more comfortable by this mode of treatment and toxic nervous symptoms are lessened.

4. The mortality, as well as the severity of typhoid fever seems to be still further diminished by this method of hydrotherapy employed as an accessory of the cool bath treatment of the disease. While recording the conclusion of these observers, it is interesting to note the mode of giving the water. Three pints daily has been set as the least amount which each patient should receive. Beside the patient's bed there is a quart bowlful of ice-water with a bent glass tube, enabling the patient to help himself with but little exertion. Four ounces of water every fifteen minutes during waking hours may be given. Every two hours during the day and once or twice at night, alternately six ounces of milk and six ounces of albumin water are given, amounting to about three pints more of fluid.

The chloride and water excretion in typhoid fever, with copious diuresis, is discussed by Sollmann and Hofmann in the same journal (February, 1905).

This study appears to have been prompted by the general teaching of chloride retention in febrile diseases. The summary and conclusion in-

dicating the results of their investigations, Sollmann and Hofmann have formulated in the following statements:

"The free administration of water in typhoid patients causes a large polyuria, exceeding three litres per day, and averaging over five litres. On isolated days nine litres are not rarely excreted. The percentage of chlorides and the total molecular concentration are much below normal, while the daily excretion of total dissolved molecules exceeds that of ordinary typhoid cases. The eliminating capacity of the kidneys is, therefore, not injured in typhoid nor by prolonged polyuria. No accumulation of fluid appears to occur in the body, the excretion being nearly parallel to the income. . . . Diuretics do not increase the polyuria nor does calcium chloride appear to diminish diuresis.

The effect of polyuria on the chloride excretion, as compared with ordinary typhoid cases, consists in a diminution of the percentage and an increase in the amount excreted per day; minor variations in diuresis affect the percentage but not the daily output. . . . The chloride excretion varies strictly with the chloride income. The effect of calcium chloride is, however, delayed and comparatively small. Agarin, sodium, acetate and nitrate and urotropin had no effect on the chloride excretion, but iodides increased it. Moderate nephritis was without effect.

The excretion of water and chloride in typhoid fever appears to obey the same laws as in health. There is, however, a greater tendency to chloride retention in the fever. The difference appears to be only quantitative and not qualitative. It is greatly diminished by polyuria.

The prolonged restriction of the chloride income appears to produce no deleterious effects and the patients do not develop any "salt hunger."

The diversity of opinion upon typhoidal insanity in childhood (*Amer. Journal Med. Sciences*, February, 1905,) has led Dr. D. L. Edsall to investigate this subject from the following points of view:

1. The outcome of typhoidal insanity, when the condition occurs in children.
2. The influence of the nature of the mental disturbance on prognosis.
3. The influence of heredity on the incidence and the outcome.
4. The frequency of such conditions.
5. The age and sex of those affected.

It appears that typhoidal insanity in childhood is not extremely rare. "It was exceedingly easy to find over 80 cases mentioned in the literature," and to these Dr. Edsall is able to add several more. Admitting the difficulty of grouping the cases, and at the same time the like-

likelihood of error—the writer finds 36 cases of mania, 26 of dementia, 6 of melancholia and 14 of delirium in convalescence with simple delusions or hallucinations, and one of chronic paranoia. A large proportion of the cases of mania show a very pronounced element of melancholia.

The outcome of the study of the cases, as shown by the figures quoted in the article demonstrates two important points. The first is that the percentage of cases in which insanity persisted (61 per cent.), is much nearer to the figures given by many alienists than it is to the statements of most medical clinicians or pediatricists. The second important point demonstrated is that dementias are of far graver prognosis than the other forms of insanity. Heredity does not seem to have any influence in causing persistence of the mental disorder, yet Edsall believes that this point has not been sufficiently investigated.

The oft-repeated statement that mental derangements are much more common in the late years of childhood than in the earlier, is not borne out by these figures. Sex seems to have no influence in determining an attack. A full bibliography is appended to this interesting article.

Another interesting nervous complication of typhoid fever is reported by Hahn (*Wien. k. Wochen*, No. 46, 1904.) A boy aged twelve years towards the end of the third week of an attack of typhoid fever developed areas of œdema, like giant urticaria over feet, face and hands. Shortly after he became aphasic, the mind remaining clear. The aphasia was of motor type and lasted for a week, and was attended with paresis of lower right facial muscles. While psychical and physical exhaustion or a gross lesion may account for similar conditions, Hahn inclines to the view that it was a vaso-motor change, toxic in origin and similar to those manifest upon the skin surface.

Coxitis. A rare complication in typhoid fever is discussed, and one example reported by Porter (*Amer. Medicine*, February 11th, 1905.) It appears that the inflammation in this joint may be due to the specific bacilli of this disease, to their toxins or to other organisms. Graff, speaking of the gross pathology of this condition, regards the synovitis as serofibrinous in character. It distends the joint and produces an inflammatory softening of the acetabular margin, and the pressure of the head of the femur by contraction in a fixed and adducted position causes a pressure atrophy of the outer part of the acetabular rim, permitting the head of the femur to slip slowly out.

W. F. HAMILTON.

RETROSPECT OF RHINOLOGY.

In this department there is perhaps no subject that has received so much attention or in which so much progress has been made during the past year as in diseases of the accessory sinuses of the nose.

In this connexion there has been extensive pathological work done, with the result of improvement in the diagnosis and treatment of these distressing affections.

Escat has reported 10 cases of chronic maxillary sinusitis, operated on by the Claoue method, which consists in opening the naso-antral wall after removal of the anterior third of the inferior turbinate. This operation appears to have given satisfaction, and has simplicity to recommend it.

Killian's operation on the frontal sinus, in which he simultaneously opens the whole of the anterior ethmoidal cells, has diminished intracranial complications, and has won a deserved popularity.

The relationship between ozæna and suppurative disease of the accessory sinuses has met with a great deal of discussion, opinions of the various writers differing as to whether ozæna is caused by or merely co-incident with suppurative disease of the accessory sinuses.

In this connexion Hajek has an important contribution to the literature in the second edition of his "Pathology and Therapeutics of Inflammatory Diseases of the Accessory Cavities of the Nose."

A series of 12 cases is recorded. In four cases the ozæna depended on suppuration in the anterior ethmoidal cells. In three cases upon simultaneous involvement of the maxillary antrum and anterior ethmoidal cells.

In two cases upon suppuration in adenoid vegetations.

In two cases upon diffuse suppurative catarrh of the nasal mucosa, and one each on posterior ethmoidal and sphenoidal suppuration.

The treatment of focal suppuration has met with sufficient success to warrant careful investigation into the ætiology of this subject.

Jürgens (St. Petersburg Med. Woch., Feb., 1904), reports a fatal case of ozæna, in which purulent lepto-meningitis was found associated with acute empyema of the frontal sinuses.

The author considers the ulcerated nasal mucosa the primary source of infection.

Dr. W. Freudenthal is of the opinion that there is always associated with ozæna a bacillus analogous to the pneumo-bacillus of Friedländer.

Another branch of rhinology which has received much attention and in which progress has been made is in the treatment of septal deformities, and the "Window resection," as practised by Bonninghaus, Killian, Freer and others, has replaced to a large extent the older methods of straightening the septum.

More time and skill are required in this submucous removal of cartil-

age and bone, but the after results are so satisfactory, according to the advocates of this method, that the extra expenditure of time and trouble involved are fully warranted.

Although nasal polypi are of so frequent occurrence, so much work has been done, and so many theories advanced as to their ætiology, this still remains more or less obscure.

E. Yonge (*Journal of Laryngology*, Sept., 1904), regards the primary source of their origin as a localized œdema of the inflamed mucosa, and the determining cause of the œdema a degenerative and cystic dilatation of the mucous glands of the part. Lambert, Lack, Thurston, Cordes, Martin and others are of the opinion that nasal polypi usually owe their origin and tendency to recur to disease of the underlying bone, this being an osteitis and periostitis. More evidence, it would seem, is needed to prove the correctness of their views, though facts would warrant one in allowing that there is perhaps some justification for them, and there is manifested in certain quarters an increasing tendency to remove, along with the polypi, any underlying bone which may be diseased, the object being to render their recurrence less likely.

Encouraged by the experience of Finsen in the treatment of lupus, Dr. D'Onisio has made a careful study of the effect of radio-therapy and light treatment in ozæna, his experience having been so satisfactory that he has established in Turin an institution where this treatment can be carried out for cases of ozæna and chronic purulent otitis media.

Braeckhart reports satisfactory results from the use of submucous injections of paraffin in the treatment of ozæna, small quantities being injected at a time.

It is claimed that this method gives good results in all cases of ozæna, except those in which there is a concurrent sinusitis. Hølsmortie also reports excellent results in atrophic rhinitis from the interstitial injection of paraffin.

The great popularity of subcutaneous injection of paraffin for the correction of nasal deformities is somewhat diminished, there being less enthusiasm manifested now than previously.

This may possibly be due to difficulties encountered in using it, to many disappointing results, and also to certain unfortunate accidents which have followed its use.

At all events it is now more generally recognized that its use has distinct limitations. Much has been written on the nasal origin of certain cases of asthma, and the relation of intra-nasal conditions to paroxysmal asthma. Alexander Francis has found that cauterization of the septal mucosa has been attended by surprising results in the treatment of this disease.

Hay fever naturally forms a subject of interest. Dunbar's serum has taken a prominent place in our therapy with by no means uniformly satisfactory results, though many cases are promptly and efficiently relieved, and it is also valuable as a prophylactic. Kyle advances the theory that in the altered chemistry of the secretions there is an explanation of many if not all cases of hay fever. According to him a local irritation is brought about in the nasal and other mucous membranes by chemical changes of the mucus-secreting glands, and that in all cases the predisposing condition is this altered secretion, the extraneous matter or pollen being only an associated factor.

By changing the reaction of the secretions, he claims to have been able to cure attacks either wholly or in part, and believes that 80 to 90% of cases can thus be relieved or cured. To Michaels, of Paris, belongs the credit of originating this theory, which, should subsequent investigation and experimentation prove to be correct, a very distinct advance in the aetiology and treatment of hay fever will have been made.

Dr. Brunow reports an unusual case, viz., chancre of the inferior turbinate. Two cases where rhinotomy by the sublabial route was performed for absolute nasal insufficiency are reported by Delsaux, the results obtained being in every way satisfactory.

In a brief retrospect of this nature, it is of course impossible to record fully all that has been done in a year's work in the department of rhinology, though it is to be hoped that to some extent the progress made during the year 1904 has been demonstrated. W. H. J.

Society Proceedings.

SOCIÉTÉ MÉDICALE DE MONTREAL.

Meeting of February 28th, 1905.

DR. O. F. MERCIER, PRESIDENT, IN THE CHAIR.

DR. L. P. NORMAND, of Three Rivers, President of the Third Congress of French-speaking Physicians of North America, communicated a paper on three cases of hypertrophy of the spleen, preceding his report by a few remarks on the physiology and anatomy of this organ.

I. Case.—Male, aged 50, no trace of malarial infection, presenting an old standing hypertrophy of the spleen, which filled the entire left half of the abdomen, but caused no inconvenience other than its great weight. Cancerous degeneration abruptly set in, without apparent cause, and rapidly carried off the patient.

II.—In a two year old child (mentally weak), was found a very large spleen. After an attack of typhoid fever, hypertrophy completely dis-

appeared. One year has now elapsed and the enlargement has not returned.

III.—Male, aged 29, had had several hæmorrhages of the stomach and bowel. On examination, a spleen, enlarged to the full capacity of the left portion of the abdominal cavity, was detected. Following a very severe intestinal and gastric hæmorrhage, an operation previously proposed and refused, was accepted. Dr. Normand performed the ablation of the spleen without trouble and a speedy and uneventful recovery followed. Patient left the hospital on the 17th day after the operation. Dr. Normand was warmly congratulated for the interesting cases reported, and the success that crowned his operation.

DR. DUBÉ said he observed a large number of hypertrophic spleens and would not hesitate to recommend ablation of the organ whenever were present serious disorders caused directly by the affection.

DR. DE MARTIGNY did not agree with Dr. Dubé and thought that hypertrophy of the spleen was rather a rare affection. He further asked Dr. Normand if quinine had been given in case No. II. during typhoid fever—for authors ascribe several cures to the prolonged administration of quinine.

DR. NORMAND answered that quinine had been given in the second case during typhoid fever, but in small doses only. Dr. Normand thanked the members for the kind welcome received, and a friendly entertainment at the "Lafontaine Club" closed the event.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The tenth regular meeting of the society was held Friday, February 17th, Dr. J. A. Macdonald, president, in the chair.

F. A. L. LOCKHART, M.D., presented a pathological specimen of hydrosalpinx, and gave a history of the case and description of the specimen, which appear at page 259.

JOHN McCRAE, M.D.—A case of atresia of the pulmonary artery, with transposition of viscera; a second case of transposition. This case report was published in the March number of this JOURNAL.

D. J. EVANS, M.D.—In demonstrating this case to the students at the Maternity Hospital, I drew their attention to the fact that the mother had a hare-lip and cleft palate and that this condition was not infrequently hereditary, so that it was wise in such cases to be on the alert for all forms of congenital deformities of the fœtus. Then in the preliminary examination and palpation of the patient the heart murmur was detected. It was systolic and of a fairly harsh character. The

possibility of the infant turning out to be a "blue baby" was mentioned to the class.

DR. RIDLEY MACKENZIE read a paper upon, Injury to Head and Face From Forceps, during Labor, with report of cases from the Montreal Foundling and Sick Baby Hospital. This case report appears on page 257.

D. J. EVANS, M.D. It is interesting to note that in all these cases reported by Dr. Mackenzie, there had been no evident injury to the brain, and this bears out the advice in the text-books as regards treatment, to leave such cases alone. It is wonderful how much damage the skull can receive without injury to the child's development, probably because the skull is chiefly cartilage and the fractured pieces are absorbed, as can be seen in one of the specimens. One of the two commonest causes of these fractures is high forceps operation before the os is fully dilated, and the other is in persistent occipital posterior cases, where perhaps the case has not been diagnosed correctly; if there has been arrest of the head high up there is great compression brought to bear on the head bone in order to facilitate delivery. One such case I have now under observation, where the child's head was large, and the pelvis was not roomy, it took an hour and three-quarters very careful work in order to deliver the child. The child is doing well but has a double cephalo-hæmatoma. There is no evidence of internal injury. The hæmatomata are slowly absorbing, though on one side I am very doubtful whether or not the skull is damaged, I was particularly careful to use compression as little as possible in the forceps operation.

The paper of the evening was read by Dr. Wesley Mills on the subject of, Certain Problems of the Nervous System. This article appeared in the March number of this JOURNAL. The following is the discussion which ensued upon the reading of the paper:

GEO. H. MATHEWSON, M.D.—There is no doubt that clinically there is some form of regeneration or taking up of the work of a destroyed nerve, which goes on very slowly in most cases. I have under observation a young man, who, some three years ago, received a violent blow from a baseball bat on the right side of the neck and chest. Immediately after the accident there was great œdema of the right arm, and the right side of the face, neck and chest, with ptosis and extreme myosis of the right eye, which proved that the cervical ganglia, or nerves of the right side had been damaged. The myosis is now only of moderate degree, while the ptosis is only to be seen when the patient is feeling tired or out of sorts. There is still dryness, due to lack of sweat

secretion, in the right arm and hand, which latter require the frequent application of oil to keep it comfortable.

Have we here a regeneration of nervous structures, or have branches from some functioning nerve made connection with the ganglia, or has some other part of the man's brain or nervous system taken up the work of the damaged structures?

G. E. ARMSTRONG, M.D.—In regard to the surgical results in nerve repair, a paper was read before the American Surgical Association by Powers, in which he found that in a very large percentage of the cases reported of nerve suturing the reports were so inaccurate and indefinite as to be really unavailable for serious discussion. In the Montreal General Hospital there have been a great many nerves sutured and the immediate suture seems to have been successful but the secondary is another matter. By immediate I mean where the ends are approximated immediately after the injury. Bridging a defective area, takes on a more serious aspect. In some of these cases the sensation was reported as returning and the after disastrous effects may have been from the fact that the growth which perhaps has destroyed the nerve has also returned and secondary paralysis with it or amputation. As a matter of clinical experience, however, cases do come to us, often months after the accident, with no power sensory or motor in the nerve, and after certain surgical procedures and the lapse of a certain length of time, the function is resumed, and the most successful of these procedures is what is called the flap method, which I think gives better results than insertion or grafting of another nerve, although this too has sometimes been successful. A case is reported I am not sure where, in which a portion of spinal cord had been introduced into a breach of two inches in the median nerve, with, if I am not mistaken, a restoration of function. Transplantation of sciatic nerve often fails completely, and yet cases are reported where catgut has succeeded, and it has been found also that a tube is of some help. Some surgeon reported that the putting in of a small bone from one end to the other, seemed to direct the downgrowth of the nerve and bring about in that way a more satisfactory and perhaps earlier communication. The question is so serious in some instances where the musculo-spiral was defective for two or three inches the surgeon resected the humerus to some extent, and in that way got the nerve ends together. One case was exhibited later and the function was pretty well restored. But of all the methods so far, I think, surgical experience would show that the flap method is the more generally successful method, but no doubt this implantation has

been very successful to a certain extent though there is a lot to learn about it yet.

A. R. PENNOYER, M.D.—I have had the opportunity of observing several cases of section of the median nerve, two particularly, that are of interest in connexion with some features of this discussion.

The first of these cases I saw twenty-two years after the median nerve had been severed, no operation for repair having been done; it presented complete atrophy of all the muscles supplied by the nerve, and the patient had a practically useless hand. Here apparently though a very long period had elapsed there was evidently no attempt at establishing a functional union through the nerves of the adjacent muscular tissue.

The other case is one in which the operation for suturing the nerve was carried out eight years ago, nine months after the injury which severed it, took place, and here there was some return of sensation on the third day after operation. The improvement in sensation and in nutrition and power in the muscles steadily improved without any after treatment—except for a short time massage—and in a year the hand was as good as its fellow. To-day one could only distinguish the affected hand by the scar of operation.

D. A. SHIRRES, M.D. There are many points which lead us to consider regeneration is from above downwards, and not from the periphery towards the centre. It is frequently noted that if a nerve is divided, say about the ankle, regeneration is slow to take place, as compared to a nerve, of the same size, that is cut in the thigh or axilla. This, I believe, goes to show that the nearer the cell body,—in other words the vital centre—injury is done to the nerve, the quicker regeneration takes place.

As Dr. Mills stated, experimenters, who had excised a piece of a nerve and given time for complete degeneration to take place in the peripheral part, found on examination—having used Pal Weigert stain—what they thought to be new regenerated nerve fibres, even though continuity between the peripheral and proximal ends of the nerve had not taken place. The mistake they made, I think, can be explained in the following way:—Those small myelinated fibres that were seen, were only myelin sheaths that had been formed from the nuclei of the neurolemma sheath; later if the ends of the divided nerve were approximated, the axones would come down and penetrate the empty sheaths. Or another explanation might be, that other nerve fibres in the neighbouring tissue had grown into the substance of the nerve and given the erroneous impression that regeneration had taken place.

Sir Wm. Gowers two summers ago, made the remark when describing the likelihood of nerve fibres creeping in and anastomosing with the peripheral part of the cut nerve, that when the Almighty gave us such a perfect anastomosis in our blood circulation, he also gave an anastomosis in our sensory neurones, and he did not doubt, though it has not been proved as yet, that we have a more or less perfect anastomosis in connexion with our motor neurones. As an example of a sensory anastomosis, take a case where transplantation of a large piece of skin has been carried out. The skin is first anæsthetic to all sensations. After some time having elapsed normal sensations develop, which goes to show how nerve fibres have a tendency to wander in and penetrate neighboring parts.

In the case where Dr. Elder removed the supraorbital and infraorbital nerves for the relief of tic douloureux, it was shown immediately after the operation that the area of the skin supplied by those two branches was completely anæsthetic to all sensations. Within a few days, sensation first subjective, then objective began to reappear. A fortnight after the operation the patient could feel touch and pain over the previously anæsthetic areas. It was impossible for regeneration to occur by that time, but the sensory fibres from the neighboring areas had grown into the region supplied by the supraorbital and infraorbital nerves. The assurance of Mott, Sherrington, and others, in London last summer, for the neurone theory for teaching purposes and for the simplifying and understanding of clinical signs is of very great value.

As to Dr. Armstrong's remark, viz.: that from what he had read of late in connexion with nerve suturing and nerve transplantation, he was inclined to believe the results were far from satisfactory, and that from his own experience in the hospital, results had not been favorable, the explanation for this is, I think, that treatment,—electricity, massage, etc.—has never been carefully carried out, or prolonged sufficiently to give satisfactory results. In the wards or out-door of a general hospital, as a rule, one has not the opportunities or time to do this.

Dr. Harvey Cushing in his operations of transplanting the facial nerve into the spinal accessory did not expect and did not get anything like perfect results till eighteen months or more had elapsed, and during that time treatment both by massage and electricity had been carefully carried out.

In my experience in cases that have come under my care within the last few years, if we failed to obtain results within a period of three or four months in cases of division of the musculo-spiral or other nerves,

where union had been established surgically the case was looked upon by the majority of us as hopeless. Now this was a mistaken idea, for in cases where we know continuity is present, in which pressure by trauma or otherwise has produced such molecular change in the nerve that symptoms of complete motor and sensory paralysis are present, we do not as a rule find function re-established before six months, or longer in some cases. How then can we expect earlier regeneration in cases where the nerve has been divided and suturing has not been carried out for months after the accident. The same can be said of cases of paralysis of motion and sensation due to pressure on the spinal cord without a break in continuity. Recovery of function, even with the most careful and constant treatment, cannot be expected under a period of eight months. In cases where the cord has been divided and an attempt made at suturing, one would have to carry out treatment likely for over a year before any marked return of function could be looked for. Therefore, I have come to the conclusion that in transplanting nerves or in suturing them or where the cord has received a serious injury we need not expect satisfactory results unless prolonged and continuous treatment is carried out.

In Dr. Pennoyer's case he stated that the median nerve had been sutured after a long period had elapsed between the time of the accident and the suturing, and that restoration of function had taken place without electrical treatment. I do not think that goes to prove electrical treatment is not of value. We know some people have recuperative powers. Some cases of pneumonia, typhoid, kidney disease, etc. etc., recover without treatment, while there are others in which if treatment had not been properly carried out, death would have ensued. The same can be said of diseased nerves. Within the last two years I have been giving electrical treatment more or less constantly every day to many varieties of nerve affections, the records of which can be seen on the file of the General Hospital. Time and again have I obtained results that were simply astonishing. They have been too frequent to be classed as mere coincidents. In the physiological laboratory, while experimenting on animals, one can see the action of electricity, in producing tone.

Medical men have not, as a rule, the belief they should have in electricity and this, I think, is due largely to the fact that the general practitioner has not the opportunity of using the different methods of electricity, nor has he the consecutive number of cases whereby he is able to judge its results. No doubt its use in the hands of ignorant men and charlatans has given a set-back to its advance, but one who is

practised and accustomed to treat cases constantly with electricity fully appreciates that this method of treatment does not get the acknowledgment it is so deserving of.

G. E. ARMSTRONG, M.D.—I would like to ask Dr. Shirres if he has come across any cases of nerve division, untreated and unoperated, and what the results are after four, five or ten years.

WESLEY MILLS, M.D.—Such a case as Dr. Mathewson has referred to indicates clearly that nervous influences are constantly emanating from the centres and passing to the periphery, with the result, among other things, of maintaining muscular tone; though the case in question shows well that the process is subject to variation. These views are now widely adopted, though I was once very much alone in maintaining them. The whole subject of sensation is difficult to study in the lower animals for many reasons, so that it is as Dr. Armstrong has pointed out, most important that all human cases of nerve-grafting should be very carefully and patiently studied. No doubt regeneration takes place more readily in our domestic animals than in man, and in young animals than in mature ones. It is a subject of congratulation that in America there is a school of biologists directing its energies largely to the subject of regeneration in general, including the influence of the nervous system, on the original embryonic formation of tissues and organs and on the restoration of lost parts in animals at different levels in the scale of animal life, and at varying ages. Our scientific salvation lies in the use of the comparative method.

Such cases as Dr. Pennoyer has mentioned are difficult to explain. It would sometimes seem that the supposed return of sensation in a very short time after operative nerve union, was a purely subjective phenomenon. Certainly sensation thus rapidly restored is rarely lasting, and none of the facts we know explains adequately such cases. The protoplasmic fibres referred to by Howell and Huber may throw some light on such cases, all the more as they are not permanent but like the sensation last but a short time, in some cases to be replaced by the proper mature medullated nerve fibres.

We have of late learned a great deal about nerve affinities. We know that the size, for example, of the nerve fibres has much to do with the question of union in any particular case. Why will not pre-ganglionic unite with post-ganglionic fibres? Why does the peripheral end of one nerve unite better with the central end of another than the reverse? Why will nerve fibres come in from outlying regions to find the peripheral end of some severed nerve? In these cases there is some ill-

understood attraction—some affinity our present chemistry does not explain.

It is plain to me that the whole truth does not lie either with those who assert or those who deny autogenetic regeneration. Both are right and both may be wrong. That the whole process is not determined directly from the centres is now clear; that they have a very great influence, both directly and indirectly, is also certain. Even the processes that take place in the peripheral severed nerve are, according to my views of the universal and constant influence of the nervous system, indirectly dependent on the influence of the centres. Again we must believe that Bethe and his followers are not wholly wrong, but that much in the process of regeneration is independent of the direct influence of the central end of the nerve. But still other facts and comparative studies are necessary before we know the whole truth on this large subject.

The eleventh regular meeting of the society was held Friday, March 3rd. Dr. F. R. England, vice-president, in the chair.

F. G. FINLEY, M.D., and B. D. GILLIES, M.D., exhibited a pathological specimen of Embolism of the Superior Mesenteric artery.

MAUDE ABBOTT, M.D.—The specimens of one of the cases of infarction of the mesentery, referred to by Dr. Gillies is in the Pathological Museum of McGill Medical Faculty. The autopsy was performed at the Montreal General Hospital by Dr. Osler in 1877. The subject was a man of 40, who had vomiting and diarrhoea for eight days before death. Post mortem there was found a large aneurysm of the abdominal aorta, from which the superior mesenteric artery was given off by a dilated orifice which contained a clot. Dissection of the coats of the aorta, at the lower border of the aneurysm had taken place and had extended into the iliac arteries, death occurring from rupture of the external iliac beneath the pelvic peritoneum.

F. J. SHEPHERD, M.D.—I should like to mention a case of my own which occurred some twelve years ago. It was supposed to be a case of appendicitis in an old woman of 65. There was sudden onset of severe agonizing pain in the right side with vomiting and great tenderness. This was looked upon as probably an appendicitis, and as she was in a rather serious condition with rapid pulse, rising temperature, and abdominal distension, I operated and found plugging of the ileo-colic branch of the mesenteric by a cancerous mass from a cancer higher up. This had caused gangrene of the caecum which produced a local periton-

itis simulating appendicitis. The patient lived for some time afterwards but she had a faecal fistula.

F. R. ENGLAND, M.D.—This case is interesting and is suggestive of the possibility that embolism may explain some of the obscure cases of peritonitis where no cause can be ascertained. I can recall two such cases where the autopsy failed to find any discoverable focus of infection.

Dr. H. S. BIRKETT reported a case of congenital bony occlusion of the right posterior naris, in which the remedial measure was the perforation of the mass with an electric drill.

R. H. CRAIG, M.D.—Dr. Birkett is to be congratulated on the successful result of such a rare condition. In July, 1903, a little girl was brought to me for nasal obstruction. Examination revealed a post nasal growth and large pharyngeal tonsils. Under anaesthesia I found that in the left posterior nares I could not pass a probe more than $\frac{1}{4}$ cm. There was marked deflection of the septum to the right and the superior half of the nose was full of pus. I advised an operation and two weeks after removing the adenoid, I attempted, and succeeded in establishing a communication between the right nasal and posterior spaces. I found that the pus came from the sphenoid. I enlarged the natural opening of the sphenoid and put in a splint, the upper half of which was perforated. I saw the case about a week ago and communication is intact, but there is still pus in the nostril though it had been completely free from this during the summer months, the condition returning with the advent of the cold weather; it now requires frequent flushing to keep it clean. I reported this case in the MONTREAL MEDICAL JOURNAL for November, 1904. In Dr. Birkett's case it would seem that the septum was very little deflected and evidently little obstruction. I would like to ask what splint Dr. Birkett would use in this case.

F. J. SHERBURN.—I have never seen this anomaly in the skull, and I think it must be rather rare, for I have examined many thousands of skulls. I do not know of any congenital condition which would be likely to produce this.

DR. H. L. REDDY gave the notes of six cases of Caesarean section, which appear at page 249.

D. J. EVANS, M.D.—I think in the cases which Dr. Reddy has quoted to-night there is no one of them in which, according to the statements in the histories of them given, any other course was open to him in view of the fact that the cases all presented themselves early in labour at a maternity hospital, where aseptic conditions prevailed and skilled assistance was at hand. I think he is to be congratulated on the fact

that he has established practically two new indications for the operation, the case of the heart disease, and the hypertrophy of the cervix; both these conditions as indications for Cæsarean section are certainly rare. In the other cases there was no other course. This operation has certainly become popular in recent years, replacing the operation of symphysiotomy, as the mortality of this to both mother and child was considerably higher than Cæsarean section. Williams has collected 335 Cæsarean operations for various causes, and of these cases, operated on by different men in Europe and America, there were only 23 maternal deaths, and a very low percentage as regards the foetal mortality. The operation is of course only to be undertaken by men of experience, in proper surroundings, and early. When the operation is left till after high forceps attempts have been made, or frequent examinations, the mortality runs up; but where the operation can be selected and undertaken early before much interference, there is no question about it as being probably the easiest way to deliver such women, both for mother and child. There is a new operation, particularly in cases where there is a relative indication of 8.5 cm., in a flat pelvis and 9 cm. in a generally contracted. This is what is known as Gigli's operation or hobotomy. The symphysis is sawn through to one side of the joint and union by callous results in a permanent increase in the diameter of the pelvis, so that in several cases the subsequent labours have terminated without difficulty. It is probable that this operation will replace symphysiotomy in minor degrees of pelvic deformity.

J. A. HUTCHISON, M.D. I would offer my congratulations to Dr. Reddy. He kindly permitted me to be present at one of these operations, and I was much impressed with the dexterous manner in which the operation was performed, and with the well trained assistants and general suitability of the surroundings.

F. R. ENGLAND, M.D.—I would like to ask if Dr. Reddy considers it always wise to produce sterility; in this case he seems to have left it largely to the wishes of the husband and wife. About two years ago, I met one of our French confreres from St. Gabriel de Valois, and he informed me that he had just done a Cæsarean section for the second time on the same patient, and that the mother and children had done well. An interesting point in the case was that on opening the abdomen the second time there was a hernial protrusion of the foetal membranes at the site of the first incision which he had made in the uterine wall. Apparently he had not rendered the patient sterile. He also used a 10 per cent. solution of gelatin to check the hæmorrhage.

D. J. EVANS, M.D.—I saw a case in Dresden of a woman who had Cæsarean section done five times. There are quite a few cases where it has been done several times. A few cases are reported where the uterus has ruptured in subsequent pregnancies, the condition of the hernia just mentioned has also been found. Recently some investigator had recorded the conditions founded in the primary wound; after repeated operation in many instances all trace of the previous uterine incision had disappeared altogether, in others the process has resulted in thinning out of the original wound; it must be in this condition that rupture would easily occur and where hernias can occur. Occasionally in the second operation the placenta has been found at the site of the uterine scar of the first operation. The softening of the scar tissue thus produced has led to rupture in a few instances.

It is early yet to pronounce definitely the limit of the indications for abdominal Cæsarean section. I am inclined to think that delivery per vias naturales by means of vaginal section or hebotomy, according to its conditions present many advantages over the abdominal route once these operations have been perfected.

F. A. L. LOCKHART, M.D.—I think Dr. Reddy is to be congratulated upon the result of his cases, and upon the fact that he has emphasized the comparative safety of the operation, when it is recognized early, and I hope sincerely that it will lead to a great many more Cæsarean sections being done throughout Canada generally, provided, of course, that they are done with proper surroundings. There is only one criticism, and that is in connexion with the case in which there was a hypertrophy of the cervix. It seems to me that it is better not to open the abdomen in these cases, and if I had had that case I would have been inclined to do the vaginal Cæsarean section, where one avoids the chance of peritoneal adhesions and consequent obstruction, and the risk of ventral hernia occurring. The case on which Dr. Reddy operated for advanced heart disease is one in which he is to be congratulated for his bravery in undertaking such an exceedingly dangerous task. One case I recall was operated on comparatively early, the disease calling for the operation was myasthenia gravis, in which there was a great weakening of all the muscles of the body. Here the abdomen was opened, the foetus delivered and the result was perfect to both mother and child.

H. L. REDDY, M.D.—Practically speaking it was Dr. England's remarks about this practitioner's work at St. Gabriel de Valois which decided me that if this could be done in a little French-Canadian town, with certainly doubtful aseptic surroundings, and by a man without any

trained assistants, then I could do it, and I decided that the next case I saw of this nature would certainly be operated upon if I had anything to say in the matter. About symphysiotomy personally I never mention the operation except to condemn it. Caesarean section is mere child's play compared with this. It takes a longer time to perform and with no certainty that you have room enough to deliver your child after all, and you may leave your patient a cripple. As regards the operation Dr. Lockhart spoke about I feel that when you have a cervix of 5 inches it would have been a very difficult operation to do, much more difficult than through the abdominal wall. As regards rendering the patients sterile: in one of the Boston hospitals, the hospital management have taken the thing into their own hands and say you have no right to render them sterile. I do not agree in this because it is quite enough for a woman to go through such a risk once, and it is your duty to advise her to be rendered sterile. This operation should be done carefully, as it certainly has happened that where the tube has been tied and cut between that pregnancy has occurred. I remember one case in which the tube was removed on the one side and the ovary completely on the other, nevertheless pregnancy occurred. In my case it was tied with No. 7 catgut, and I am in hopes that sterility will be produced.

Joseph Macdonald, M.D., has severed his connection as managing editor of the *International Journal of Surgery* and has purchased all rights in the *American Journal of Surgery and Gynecology*. With the April number this Journal, modernized and largely increased in circulation will be issued from New York as the *American Journal of Surgery*.

Phipps' Institute for the Study, Prevention, and Treatment of Tuberculosis.—According to the report for the year 1904, 2,039 patients were under observation, of whom 1,130 were native-born and 769 were foreigners, while of 140 the nativity was not recorded. Many of the foreign-born had been in the United States for so short a time that it is assumed they were infected before landing. Of the entire number 6½ per cent. were negroes—a larger proportion than that of the negro to the white population of the city. Improvement took place in 537 patients, no improvement in 583, the result was not recorded in 884, and death resulted in 153.