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BIBLICAL MEDICINE AND HYGIENE.

BY

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“Honour a physician according to thy need of him with the honour due unto him: for verily the Lord hath created him. For from me Most High cometh healing: and from the King shall he receive a gift. The skill of a physician shall lift up his head: and in the sight of great men he shall be admired. The Lord created medicines out of the earth: and a prudent man will have no disgust at them.” So wrote Jesus the son of Sirach, in Ecclesiasticus. But amongst theologians many texts, such as “They who minister about holy things should live of the gospel” are more popular. In fact, these verses have received scant notice. One writer—a humorist, no doubt—correlates them, as is the theological custom, with certain New Testament verses, and concludes that these are the physicians of whom the woman with the issue of blood had suffered many things, and on whom she had spent all her living. Yet the proverbs of the ancient Hebrews refer to the physician in equally favourable terms: “A wise man will not live in a town where there is no physician”; “They that are whole need not a physician, but they that are sick.”

It has repeatedly been observed that the Hebrew race, in spite of centuries of wandering, is remarkably healthy. To-day they enjoy a relative immunity from tuberculosis (Osler), and when they do not lapse from the Levitical code, frequently escape zymotic disease during an epidemic. This cannot all be attributed to the original virility of the clan because no Jewish blood is pure to-day. An explanation can be found, however, when we consider that which Israel Zangwill has termed the “pot and pan part of their religion” was, in reality, a religion of cleanliness and implied the ability on the part of the priests

of diagnosing many diseases and embodied rudiments of preventive medicine.

The connexion between religion and medicine was not an unmitigated blessing. Accurate medical knowledge now obtained by post-mortem examination was impossible on account of the ceremonial uncleanness which followed contact with a corpse. Further, the annual gathering of the people in high places aided in the dissemination of disease and was productive of much vice and immorality.

Two theories of the etiology of disease in general held sway: (1) The Demonic; that some diseases were due to the possession of the patient by some demon, or if the illness was very severe, by a legion, at least, of evil spirits; (2) The Punitive; that diseases were meted out as punishment by Yahweh for sins either of the patient or of some of his ancestors. Hence, when any one took sick, the head of the family carried an offering to some temple and asked as to the fate of the patient. If the answer came back that he must die, then, as with the Greeks, it was considered useless "to strive against the Gods." A favourable answer and promise of recovery also freed the friends from anxiety and made treatment unnecessary. "If thou wilt diligently hearken to the voice of the Lord thy God and wilt do that which is right in His sight and wilt give ear to His commandments and keep all His statutes, I will put none of these diseases upon thee which I have brought upon the Egyptians, for I am the Lord that healeth thee."—*Exod.*, XV, 26.

While tracing their diseases, as they did their origin and theology back to the "First Cause," the Jews recognized secondary causes as operative in the production of disease. When the Philistines were stricken with what was probably the bubonic plague they evidently recognized as we do to-day that the disease was carried from one section of the country to another by rats and mice, for they endeavoured to propitiate Yahweh by offering five golden images of the most noticeable result of the disease and five golden rats—images of the probable disseminators of the plague. Again, when the wanderers' in the wilderness wearied of manna and craved for a more varied menu, an epidemic broke out in the camp, which the people attributed to the quail which they had just eaten.—*Num.*, XI, 33. To-day we know that the quail probably carried infection to the Hebrew camp from some other band of wanderers, it may have been some Bedouin caravan.

From the accuracy of the Biblical descriptions we know that many diseases were recognized by the ancient Hebrews. Saul, "naturally a shy, self-conscious man, easily exalted into ecstasy and tyrannical self-

satisfaction, possessed of an impulse to homicide, turning against his own son, and finally becoming despondent and meeting with death by suicide" (Hasting's Bible Dictionary), was a victim of recurrent paroxysmal mania. Nebuchadnezzar, like the daughters of Proetus, suffered for seven years from monomania, believing that he was a beast. Nabal, after a hearty supper and a somewhat riotous night was stricken with apoplexy and died ten days later; or, as the Hebrew states it, "his heart died within him and he became as a stone, and it came to pass about ten days later that the Lord smote Nabal that he died."—*I Sam.*, XXV., 37, 38.

Ahijah's eyes were "fixed by age," a poetic description of senile cataract. Epileptics were common in Bible days as now, but nowhere do we find a more accurate account of an epileptic seizure than in *Luke IX*, 39: "And lo, a spirit taketh him and he suddenly crieth out: and it teareth him that he foameth again, and bruising him hardly departed from him." Again, a priest who had contracted spinal caries could not minister in the sanctuary, and the same prohibition was applied to a man with a flat nose—doubtless a sign of the same disease, as Hogarth meant it to be in so many of his pictures.

Palsy, of which we read so frequently, was equivalent to the word paralysis of to-day, a symptom of many diseases of the nervous system. The centurion's servant probably had meningitis, *Matt.*, VIII, 6; while the man with the withered hand, *Matt.*, XII, 9-13, could probably date his disability from an attack of infantile paralysis.

Palestine was naturally a healthy land. A country of hills and valleys, with rapid streams not easily polluted, and having no harbours, could have few imported epidemics. Yet we read of diseases which we must attribute to the climate. One of the promises held out to the godly by the Psalmist was, "the sun shall not smite thee by day nor the moon by night," *Psalms*, CXXI, 6; an immunity which would be valued by a community whose history recorded deaths by sunstroke, such as that of the Shunammite's son, *2 Kings IV*, 19, and of Menasses, *Judith VIII*, 3. In *Deut. XXVIII*, 22, we have reference to fevers, probably of malarial origin, and to "consumption," which some have identified as modern pulmonary phthisis; while the Jewish proverb, that it is easier to rear a forest of olive trees than one child, would indicate that infantile diseases were exceptionally severe.

Surgical cases then, as now, were considered more dangerous and, consequently, brought greater fame to the successful physician. The woman bound by the spirit of her infirmity, *Luke XIII*. 11-17, was a case of senile kyphosis; while Lazarus, *Luke XVI*, 20, was the typical

beggar outcast from society, who can be seen at any of our city dispensaries suffering from varicose ulceration. That the priests possessed some accurate surgical knowledge cannot be disputed, for the rite of circumcision was delayed if the child was jaundiced—a fact that would indicate that they appreciated the danger of hæmorrhage in such conditions. Few cases of accident are described in the Bible, but that which happened to Abimelech is described at sufficient length to give us ground for diagnosing fracture of the skull, the retention of consciousness showing the absence of compression.

The reproach of Van Helmont, that "a bloody Moloch presides in the chairs of medicine" could not be brought against the Hebrew physicians as the sacredness of blood prohibited bleeding. In Proverbs XXX, 15, we have reference to the use of leeches.

Their materia medica consisted of balm of Gilcad, myrrh, cinnamon, cassia, aloes, calamus, spikenard, camphor, and mandrake. Folk-lore medicine, as amongst primitive people attributed healing virtues to saliva, and the first aid to the injured rendered by the good Samaritan when he poured oil and wine into the sufferer's wounds was certainly surgically orthodox. They were ignorant, however, of dietary laws, and we cannot but think that Hezekiah was in greater safety when Isaiah prescribed a fig poultice than his kinsman who enjoyed a diet of fig pudding.

Osler, in his "pessimistic therapeutic nihilism," as some of his truthful statements about medicine have been termed by the American writers, has stated that much of the humbuggery of the profession still lingers about mineral waters. But if, as theologians tell us, "never yet has any particular doctrine or mode stating truth held its own for any length of time in human history unless there was some genuine truth beneath it," then we must still count mineral waters of some therapeutic value, since the Hebrews believed in their efficiency even as the Gentiles of to-day. The saline waters of the Jordan, the miraculous healing power of the pool of Siloam, and waters of Bethesda were well known to all devout Jews. And to-day their descendants still bathe in the pool of Bethesda for rheumatism and other disorders. They still believe that the waters are more efficacious when they are "troubled," that is, when the natural syphon under the cave overflows.

One factor which probably contributed in no small degree to the health of the Jewish race was their care in providing good water supplies, that of Jerusalem being particularly complete. The city was supplied by five conduits. One, supposed to have been constructed by Solomon, was thirteen and a half miles long, two feet deep, and one

and a half feet wide, and conveyed water from Solomon's pool to the temple. Another conduit connected this with a reservoir twenty-eight miles away. This latter passed through two tunnels, one four miles and the other seventeen hundred feet in length, while between the two was a reservoir which served as a sedimentation tank. The water was distributed in Jerusalem by leaden pipes to fountains, cisterns, and pools open to the public. We speak of the Jews as a primitive people, and yet contrast this water supply with that of many of our large cities—drawn from rivers of commerce, within a short distance of polluted harbours, conducted to the city and stored in uncovered reservoirs, open to infection, to be distributed to a typhoid-stricken public without filtration or even sedimentation.

Of sanitation as we understand the term to-day the Jews knew little. The hungry dogs of the city acted as scavengers, and the sewage disposal was of the crudest character. But even as their primitive views of Yahweh as the national God evolved into the "one God, one law, one element," of to-day, even so were their ceremonial ordinances concerning leprosy the beginning of modern preventive medicine. Suspected lepers notified the priest: they were isolated for twenty-one days, and examined by the priest at weekly intervals. To-day we know that the Jews confounded many skin-diseases, such as vitiligo, with leprosy, but yet we see here the origin of our system of notification and quarantine of infectious diseases.

As regards food the Jews were very particular, for was it not written in the law what a man should, and should not, eat? Animals of the herbivorous and ruminant groups were allowed, but no beasts of prey: nor could the fat or blood of any animal be used. In butchering there was, as there is at present, rigid inspection by one of the rabbis, who had definite rules for the detection of diseased meat. "Seven days shalt there be no leaven found in your houses," *Exod.* XII, 19, provided for a very necessary renewal of food supplies.

Amongst a people whose religious nature was so dominant such sanitary regulations could not but markedly effect the vitality of the race. For whether we regard them as the ear-marks of a people chosen by God or consider them only in the light of their modern practical and hygienic value, the old promise is still true: "If thou wilt diligently hearken to the voice of the Lord thy God, and wilt do that which is right in His sight, and wilt give ear to His commandments, and keep all His statutes, I will put none of those diseases upon thee, which I have brought upon the Egyptians. For I am the Lord that healeth thee.—*Exod.* XV, 26.

A MACHINE FOR THE FORCIBLE CORRECTION OF DEFORMED FEET.

BY

J. APPLETON NUTTER, B.A., M.D.

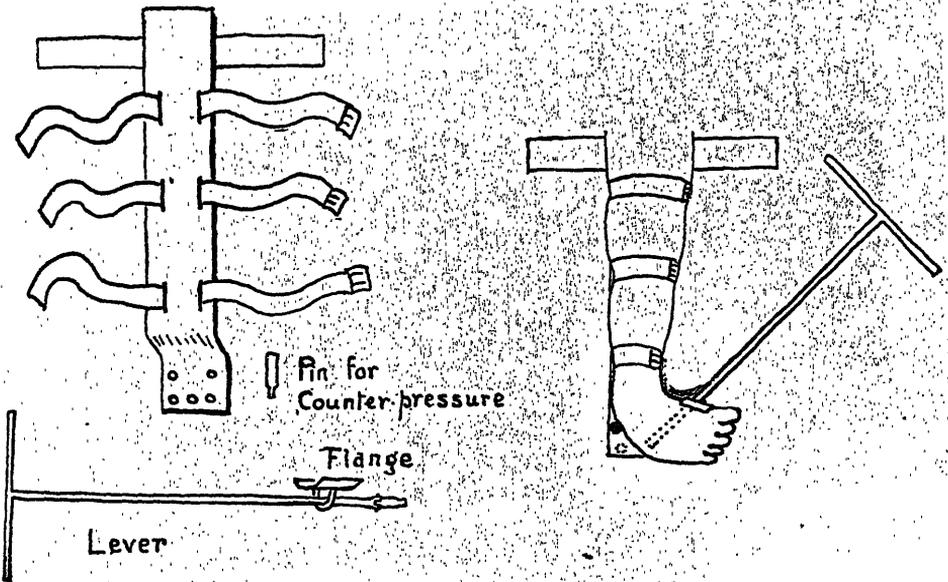
The spectacle of a surgeon wrestling with a deformed foot is a common one. Some operators claim to derive keen pleasure from the exercise, even though it bring flushed cheeks and a beaded brow. The necessity for strenuous efforts has, however, led to the introduction of many forms of wrench or lever to aid the power of the hands, and in Canada the most familiar of these is the Thomas wrench.

The contrivance described below presents, it is thought, original features, and is for this reason presented for consideration. It consists of a body and a long lever. The body is a piece of iron several inches broad and somewhat longer than the lower leg, shaped to permit this to rest evenly upon it. It is pierced by a series of holes for tapes fitted with buckles, which are used to secure the leg from the knee to just above the ankle. The upper end of the body presents a cross piece to prevent rotation of the leg; the lower end is curved to fit the prominent heel of a club foot. The heel piece is pierced by numerous holes to receive the end of the lever and an iron pin for counter-pressure. Both lever and pin can be placed wherever they will act to the greatest mechanical advantage.

The lever is long and strong and at its distal end has a cross bar to serve as a handle, should twisting be required. It is jointed close to its proximal end, the smaller piece being received into one of the holes in the heel piece. Its joint permits of motion in all directions, including twisting. Attached loosely to the lever is a small curved flange of iron which, well padded, is to transmit the force of the lever to the foot.

If we suppose the foot to be operated upon is a talipes equino-varus of the congenital variety, the deformity first to be corrected is, according to common custom, the varus. If considered necessary, any cutting operation, as tenotomy of the plantar fascia or the astragalonavicular ligament, is first done. The leg is then strapped to the body of the machine (previously sterilized), and the pin (well padded) adjusted in the region of the cuboid bone. This latter is done because the deformity in a typical case of equino-varus in medio-tarsal and not at the ankle joint. The lever is then adjusted to the socket where it can be used to the greatest mechanical advantage, and the flange, well padded, is placed against the inner border of the foot in the region of

the head of the first metatarsal. By the lever the foot is then forcibly over-corrected into a valgus position. This is to be done by successive strong efforts rather than by a slow, steady advance. An assistant will steady the leg on the table. When the varus deformity has been turned into a valgus, *i.e.*, when the foot turns out instead of in, the equinus deformity is to be remedied. As a rule this yields readily after tenotomy of the tendo Achillis. Here the use of the pin for counter-pressure is not necessary. The flange is applied to the ball of the foot after shifting the lever to the most convenient socket. By its means the tendo Achillis is stretched and stretched again until the foot readily assumes the calcaneus position. The secret of a good



result seems to be thorough over-correction and the maintenance of this by plaster of Paris. It is a good rule to persist in the wrenching until the position of over-correction can be kept by a single finger.

In applying the plaster, many orthopædic surgeons extend it above the knee, flexing this to prevent rotation of the cast. The most difficult part of the plaster work will be found to be the maintenance of the over-correction. It may be found, when all is over, that the foot is barely corrected and not at all over-corrected. A good way to make sure of the result is to first immobilize the knee by plaster extending from above it down to near the ankle. While this is drying, apply plaster to the foot and toes, not including the ankle. When

both of these have set firmly, it will be found that the rigid knee and plaster-covered foot afford a grip that is most satisfactory. The surgeon himself can then hold the foot in over-correction, and his hands need not be moved by the application of plaster by his assistant to the uncovered region of the ankle.

The machine is also useful in cases of paralytic club feet, and in flat feet of the rigid type. In the treatment of the latter the aim is to get a combined varus and inversion. Hence the pin is placed opposite the astragalo-navicular joint, and the flange at the outer border of the foot. Any one who has wrestled with a flat foot, twisting it between his knees, will know that considerable, often great, force is required.

My thanks are due to Dr. E. H. Bradford, Professor of Orthopædic Surgery, Harvard Medical School, and Orthopædic Surgeon to the Children's Hospital, Boston, for advice and encouragement during the construction of the machine. By his kindness I was enabled to make use of it in a number of cases of club feet of different types at the Children's Hospital with gratifying results. I have also to thank Mr. J. H. Chapman, McGill College Avenue, whose well known care has been used in the making of a machine for use in Montreal.

TABES DORSALIS AND ITS RE-EDUCATIVE TREATMENT.

BY

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Mr. President and Gentlemen:—

It has seemed to me from my hospital experience here, that a small demonstration of Fränkel's methods of re-educating Tabetics might serve some practical purpose, as no elaborate apparatus is required, and the treatment can be carried out by any physician who has the time and patience to devote to it. The results too are so satisfactory in the great majority of cases that no case should be allowed to develop a bed-ridden condition, or to anything approaching such a condition, owing simply to the ataxia. Even if they have already reached such a condition, in the absence of arthropathic disorganization of the joints, or of very extreme hypotonia, the prognosis is still fairly good.

Before taking up the method of treatment I wish to discuss shortly the pathogenesis of Tabes Dorsalis.

You are all familiar with the pathological picture of marked degeneration of the posterior columns, most marked in the ordinary cases in the

lumbar region. Farther up in the cord the degeneration has become localised to the postero-median column, except in the rarer cases of cervical tabes. Degeneration in the posterior roots and the fibres of Charcot's root zone and those to Goll's and to Clarke's columns, the latter probably being chiefly instrumental in bringing about ataxia. This degeneration is in the lumbar region chiefly, rarely in the dorsal, but occasionally in the cervical. Slight and scattered degeneration in the posterior ganglia and some degeneration in the peripheral nerves, is also seen. In the cord too in advanced cases the endogenous fibres of the posterior columns, that is those fibres which connect the various sensory levels, show degeneration,—this is not present in the preataxic stage of the disease (Mott. *Tabes in Asylum and Hospital Practice*, Archives of Neurology, Vol. II., 1903, pp. 1-327).

As an associated condition Mott describes in some cases of his series a degeneration in the pyramidal tract affecting those fibres most remote from the centres of nutrition, *i.e.* in the longer fibres of the tract—those to the lower extremities. This fact seems to me to be very significant and is probably what has already happened in the sensory neurones. As if in the presence of a toxine the neurones had simply faded, and, as in a plant with insufficient nourishment, the branches farthest away from the roots are first affected.

Many theories are advanced as to the etiological factors which bring about this pathological picture. Most authorities attribute to syphilis the essential or at least the preponderating role as a causative factor, although exposure to cold, fatigue, injury, and various toxines are also mentioned, only to be assigned by most to a secondary place in the etiology of this disease. According to various authorities the disease may start:—

1. In the intramedullary part of the posterior roots alone.
2. In their extramedullary portions, either (a) at the site of their passage through the dura mater and arachnoid, in which situation Nagiotte has described a condition of perineuritis, or (b) according to Obersteiner and Redlich, at the site of their passage through the pia mater and the peripheral neuroglial layer, in both of which they have described a chronic thickening in cases of tabes. But this perineuritis described by Nagiotte is not present in all cases of tabes, and certainly in cases of spinal meningitis where the meninges are thickened we do not get symptoms of tabes. Moreover, this condition of chronic posterior meningitis described by Obersteiner, though present in many cases of tabes, is by no means present in all. The thickening in the peripheral neuroglial layer is probably secondary to the alterations in the spinal cord.

3. Marie and Oppenheim have been inclined to attribute it to a primary disease of the cells of the spinal ganglia, but this is usually insignificant and insufficient to explain the degeneration in the fibres.

As the etiological basis of these various theories either a definite syphilitic lesion or the action of a syphilitic toxine on the posterior ganglionic cells, is called into action. Fournier was the first to point out the close relation between syphilis and tabes and Erb has found as many as 90 per cent. of his tabetics gave a more or less definite history of the infection. Gowers' statistics are not so high, amounting to about 80 per cent.; others are less still.

4. Von Leyden looked upon the disease as a peripheral neuritis induced chiefly by exposure to cold. Such a neuritis may occur, but in that case the motor fibres are equally involved with the sensory and in the ordinary case of tabes the purely motor functions are not altered.

One is immediately struck with the multiplicity of these hypotheses and their inadequacy to explain many points in the symptomatology of tabes, such as, the optic atrophy, the cranial nerve palsies, Argyll-Robertson pupil, etc., which are so frequent.

Tabes is not a syphilitic disease. Everybody recognises the fact that specific treatment has no influence on the course of symptoms, and the hypothesis that it is due purely to the action of some syphilo-toxine leaves many things unexplained. For instance, why is it so much more common in men than in women and why it is not common among the coloured races where syphilis abounds. And again, if it were due to a syphilo-toxine merely with an elective action on the sensory neurone, why are some parts of the sensory apparatus involved and not others? Tabes is thus not a systemic disease in the true sense of the word.

It is not my intention to discuss these various hypotheses further, which we see are wholly inadequate to explain the disease, but I would like to consider more fully the exhaustion theory first formulated by Edinger, and to point out the indications towards the prophylaxis of the disease and its relations to the re-educative treatment of ataxia. We know that functional activity of a cell is evidenced by certain changes in the Nissl bodies,—by increase in their number, change in their disposition and finally by their disorganization. If the activity is persisted in, the cell itself shows changes with eventual extrusion of its nucleus and its own complete disorganization. We know also that complete reorganization of the cell may take place at any stage, before the nucleus is extruded, under the influence of rest.

The anatomical basis of Edinger's theory was given by Weigert who pointed out that all the cells of the body are normally in a state of

equilibrium, the one with the other, so that if a cell becomes weakened by disease, or from any cause, others which lie near it must grow, eventually crushing it out and taking its place. Let us apply this to the nervous system,—we may get such a weakened condition in congenital states. These have been described by Gowers under the term “Abiotrophy,” where simply from an inherent lack of vitality certain cells cannot last out the normal span of life,—they gradually die and their place is taken by the surrounding tissue. Again, where the amount of work required of a group of cells is abnormally great, even if their inherent vitality be perfectly normal, those cells may succumb simply from their inability to recuperate the loss of tissue due to the abnormal functioning. Such conditions one sees in occupation palsies, of smiths, etc., which, it is true, usually occur in under nourished individuals.

Thirdly, if the nutrition of the cells be impaired through a toxine circulating in the blood then the normal amount of work required of a cell may be *relatively* too much and its recuperative power being impaired it gradually dies. At the same time everyone recognises the fact that certain toxins have an elective action on certain parts of the nervous system. As an illustration of this, those interesting cases of Lillienstein may be cited, showing the incidence of disease falling on the part or parts of the body that had been in a state of functional over-activity.

A. A girl employed in a type foundry suffered from plumbism and the condition affected, not so much the extensors of the wrist and fingers, as the muscles supplied by the ulnar nerve. It was discovered that the girl's occupation entailed a constant quick deviation of the wrist to the ulnar side when she was filing type.

B. Another girl employed as a telephonist developed neuritis in the right arm, seemingly attributable solely to continually holding the heavy receiver in the right hand. The adoption of another apparatus which did not necessitate the employment of the right hand was followed by a disappearance of the symptoms.

Numerous other cases might be quoted. In tabes a similar condition is present. In this disease the reparative processes in the cells is impaired, due to the noxious action of a toxine on the general system, this toxine in most cases being syphilitic in origin, and those neurones which are normally most active, or most constantly at work, are those which suffer. These are, the sensory nerves from the muscles which take an important part in the regulation of muscular contraction and are constantly submitting those stimuli by which we can become aware of the condition of our muscular system and the position of our limbs.

These are constantly at work, probably almost as much in our sleeping as in our waking moments, although the stimuli do not necessarily reach consciousness. Those neurones of the lower extremities, conveying constantly sensations for the maintenance of our equilibrium, naturally in the majority of people work more strenuously than those from the upper limbs, and usually are first affected. Their degeneration is clinically expressed in the loss of the muscular tone, the sense of position of the limbs and the consequent ataxia.

Although numerous cases might be cited where the incidence of the disease has been in the arms or elsewhere owing to relative over functioning, — for instance Mott reported a case occurring in a mounted policeman in whom the symptoms started in the arm with which he held his reins. Edinger reports two box-makers, one carpet layer and a letter sorter in the post office, all affected in the upper extremities. Also a naval officer with a history of primary infection who remained healthy until after a whole day in the blazing sun straining his eyes superintending target practice, developed an ocular palsy; this disappeared with rest but reappeared again later, and the man eventually developed true tabes.

Secondly, the purely sensory nerves which are constantly submitting sensations from the skin and mucous membranes would be liable to suffer and give rise to sensory disturbances. Thirdly, the eyes would suffer, and above all the constrictor iris which is constantly active in the reflex contraction of the iris to light, which must be almost constantly at work in contrast to the reflex arc for accommodation which is relatively seldom working. Thus is produced the Argyll-Robertson pupil.

In the same way the paralysis of the external ocular muscles, the bladder disturbances, the occasional atrophic muscular palsies can all be explained. One might ask why the peripheral motor neurone does not suffer equally with the sensory. To this Holmes has suggested the reply that the peripheral motor neurone is normally capable of responding to two sets of stimuli. First, those from the upper motor neurone, which are relatively seldom at work, and secondly, those from the peripheral sensory neurone, keeping up the tone of the muscles; it has the opportunity to repair when it is not at the service of voluntary impulses, it therefore would not be expected to become exhausted so readily as the sensory neurone, and when, the sensory neurones having degenerated, it does not get stimuli from them, it has still more time to repair.

If we accept this theory it is no longer necessary to look upon every tabetic as a syphilitic. We can understand also how trauma, exposure to cold and wet, excesses of any kind, can each be recognized as a pre-

disposing cause, which acts by disturbing the nutrition of the nervous unit, and we can understand the exacerbations of the disease following acute illnesses. Further, the well known fact that when optic atrophy occurs ataxia does not, or if already present does not increase, even tends to improve in many cases, is easy of interpretation. An adult who has become blind is not capable of performing much, and so his nervous system is spared the stress by which ataxia is produced. In the same way the relation of tabes to sex becomes explicable, men being more exposed to those influences which according to this theory we must look upon as etiological factors in the disease.

Again, the relative immunity of certain coloured races is comprehensible as their nature and climate are not likely to permit them to expose themselves overmuch to strain and overwork.

Realizing in this way the origin of tabes the physician has valuable indications for treatment, at least as far as prophylaxis is concerned. Now for the practical application of this theory. One must reckon with the possibilities of exhaustion wherever it has once shown itself. The patient must have rest and be guarded against overexertion, and at the same time his general condition and metabolism improved if possible. Of course, in cases of excessive obesity this should be reduced before the treatment is undertaken.

As a matter of routine the patient is told, and it must be impressed on him, to empty the bladder every three hours at least whether it seems necessary or not. The habit is very quickly acquired and in this way the bladder itself, and the nervous apparatus in connection, are saved from strain and exhaustion. Practically this has been found to save the patient from the distressing incontinence too often seen, thus bearing out the truth of Edinger's theory. The optic nerves also should be guarded against every strain, errors of refraction should be corrected and the eyes shielded from the glare of the sun in summer or winter by coloured glasses,—the patient should be warned against straining the eyes in any way.

During the treatment, where it is possible, these patients are ordered massage and faradic stimulation of the muscles on alternate days, simply to take the place of exercise in stimulating metabolism without the fatigue consequent on a relative amount of exercise.

In the hospital one has often noticed that patients who at first could not bring the index finger accurately to the nose with the eyes closed, after their first surprise at their failure to do such an apparently simple movement, practiced it with excellent results, and one would say, "That is scarcely a fair test because the patient has practiced it." To

Frankel must be conceded the honour of seeing with the understanding eye and using this clinical fact to overcome the ataxia, not only in the arms but in the legs. These exercises are simply the practice of various movements by the ataxic limbs, at first, at least, under the guidance of the eyes until they become re-educated. I propose, then, with your permission, Mr. President, to have this patient go through some of these exercises.

First, those in the recumbent position. We have here two sets of apparatus which are the most useful among many. The patient's head should be raised by a wedge-shaped cushion so that he can see his feet and at the same time be quite comfortable. This first exercise is simply one of co-ordination in extension and flexion of the legs and may be varied indefinitely. The tendency for these patients is to allow the leg to fall out in abduction.

The patient should be told to keep the foot dorso-flexed in this way overcoming to a certain extent the hypotonia of the great calf muscles. First the patient should place the heel in the most distal hole of the board and then by means of flexion of the knee, drawing the foot along the board, place it in the next distal hole, and so on first one leg then the other; or they may be alternated or both work together.

Next, the hip should be more flexed the foot being raised off the bed, then extended and the heel placed in the next hole. By way of variety a halt may be called in the middle of this movement and the leg held steady in this position for a moment. This is difficult and tiring and should not be attempted till the patient has had some practice. Applying Edinger's theory again, we must avoid tiring the patient, otherwise we produce an increase in the symptoms rather than an amelioration, this has been proved clinically. It is thus necessary for the medical man to supervise these exercises carefully himself in order to avoid fatigue, as many tabetics owing to their loss of sensibility do not appreciate fatigue as readily as normal individuals. It is therefore necessary to take the pulse before and during the exercises. It will be found in cases of extreme ataxia to rise rapidly from normal to 120-130, especially at first when the patient is unaccustomed to the exercises. A rest must be given till it comes down to normal again. It must also be remembered that the exercises are for co-ordination and not to increase muscular power, therefore any exercise that requires much strength and is of no proportional value from the point of view of co-ordination should be avoided as harmful.

Another useful apparatus is No. 2. The idea here is for the heels to be placed in these notches, then one leg to be flexed at both thigh and

knee, being again extended, and this must be done slowly, the heel is then put into the next notch. This exercises, the co-ordination not only of the flexor and extensor groups, but of the abductor and adductor groups as well. These should also be varied frequently. It is well not to allow a patient to go through one exercise more than four times lest he wearies of it and does it negligently; keep changing them in order to keep his attention. This is a very important part in the re-education.

Exercises in the sitting posture. In patients who are unable to walk such exercises as flexion and extension of the thigh, especially adduction of the thighs, placing the foot on the floor firmly, etc., extending and flexing the knee, placing the feet in footprints marked on the floor. The patients should be fully dressed and wear stout boots in doing these exercises.

In every case, however, we should practice such important movements as rising up and sitting down. In severe cases the attempt to rise from a chair is very awkward. The patient makes futile efforts by moving the body in one way and another, but it seems not to occur to him to make the necessary movement of drawing his feet back and under his body and bending his body forward so that the centre of gravity comes in front of the ankle joints, as soon as he is reminded of this he usually learns to get up within a few minutes. When sitting down the patients simply let themselves fall into the chair whenever they try to sit down without leaning on the arm rests. This is the result of neglecting to bend the body forward while flexing the knee and hip joints. These movements may be practised in connection with the walking exercises.

For these exercises I have had this strip of linoleum marked out in longitudinal and transverse lines to represent an ordinary long step of 28 inches. This has been subdivided into half and quarter paces. At either end there is a diagram for teaching the patient to turn, a movement in which they usually have a good deal of trouble.

Patients should be lightly dressed. Women should wear Knicker-buckers at first and all should wear high laced boots to strengthen the ankles.

There is always a tendency for these patients to try and walk too fast, this, and a tendency to outward rotation of the legs must be corrected. He must walk slowly and carefully, watching his feet and putting his toes just to these transverse lines. It is well to start with quarter or half paces only taking a full pace when more proficient.

Side stepping also may be practised on this diagram and it is a good thing to have several patients practising at the same time so that they may learn to avoid each other readily, as one has to in the street.

Later the patient should practise walking with his eyes directed to the floor some distance in front of him, and later with them fixed on the horizon. In very severe cases it might be necessary to have a strong belt with handles on it so that attendants may support the patient without grasping his body.

These exercises should be undertaken twice a day, not oftener; in the morning after the massage or the electrical treatment, the exercise in the recumbent posture; in the afternoon the walking exercises. The exercises for the upper extremities are on the same principle and I will not take up the time of the meeting with them. As I have said the results are excellent as a rule, especially in patients who have been accustomed to take active exercise and who are determined to get well. One sees improvement not only in the movements of the limbs, but in sensation generally and in the pains; both these patients who had severe pains, have been practically free from them since their course of treatment. These are not isolated cases. The results are more or less permanent if the patient's occupation does not entail constant overstrain. In any case, if the ataxia does increase again, re-education a second time is always more readily and more quickly carried out. Optic atrophy with blindness is not an unsurmountable obstacle to this treatment if the upper extremities are not ataxic. If the sense of position in them is not lost, with the hand placed on the thigh, even without visual aid the patient can guide the lower extremities in the various movements.

SOME CLINICAL OBSERVATIONS ON EPIDEMIC CEREBRO-SPINAL MENINGITIS.

BY

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The large number of cases of Cerebro-spinal Meningitis occurring in the hospitals of Montreal during the past winter; the prominence given the disease in the recent outbreaks in New York, Dublin, and Glasgow; the universal interest which some of these cases present; as well as the excellent work which has recently been carried out on this disease, have induced me to bring this subject before you.

Although we have been fortunate enough to escape anything of the nature of an epidemic in this country, we have had a large number of sporadic cases, usually appearing singly, but occasionally two or three members of a household have been attacked simultaneously.

I have accumulated reports of 46 cases from the Montreal General Hospital and Royal Victoria Hospital reports during the past eight

years, and my remarks are based on this series. No case has been accepted as evidence unless either the meningococcus has been isolated from lumbar puncture by a competent bacteriologist, or the autopsy showed the characteristic lesions and the specific organism.

During the past year we have had 26 cases of epidemic cerebro-spinal meningitis in the Royal Victoria and Montreal General Hospitals.

Season.—With regard to the season of the year, the winter and spring months show the largest number of cases, the month of May heading the list. Occasional cases occurred in the summer months, the only month in which the disease was absent being September.

Age.—Koplik reports that in the New York epidemic the greatest frequency in age was in children under two years. Councilman in Boston, found the greatest frequency between twenty-six and thirty years. Westenhoffer, out of over 3,000 cases in the recent epidemic in Silesia reports 90 per cent. under fifteen years of age. In our series the largest number of cases occurs between the years ten and twenty. Arranged in decades the ages are as follows:

0—1 year.	1
1—10 years.	14
11—20 “	16
21—30 “	6
31—40 “	4
41—over	4

The youngest patient was seven months old, and nursing at the time. The oldest was 52.

Sex.—10 cases females, 36 males.

The Mode of Onset.—The most prominent feature of the onset in this series was its sudden and abrupt nature. This is so evident that definite mention is made of the suddenness in 24 cases (52 per cent.). In some cases patients are first affected while at work, or children while at play or school. In four cases, however, of this series special mention is made that the onset was not sudden but gradual. Of the initial symptoms two stand out in much greater frequency than the others: (1) vomiting, (2) headache.

(1) Vomiting was nearly always present (74 per cent.) of cases. It was frequently almost continuous, lasting in one case three days, but it is noted that in the most severe type of the disease vomiting may be absent entirely, as happened in three cases of this series.

(2) Headache and pain in the neck were the next most frequent symptoms of the onset, and were very frequently present (69 per cent.)

of cases. The pain is usually confined to the occipital region and the neck, and tenderness of the spines of the vertebræ may be present.

Of the other symptoms of onset, rigidity of the neck, and retraction of the head set in sometimes as early signs, more frequently not till twenty-four or forty-eight hours had passed.

Chills are not uncommon at the onset and occurred in 22 per cent. of this series. Chilliness is still more frequently seen without a definite rigor. Convulsions ushered in the attack in three cases, not children (6 per cent.).

Consciousness may be lost within twelve hours, and coma and delirium may be early symptoms in the more virulent cases.

In addition to the above the usual signs of onset of any toxæmia may be noted, as, pains all over the body, anorexia, weakness, photophobia, constipation and intolerance of sound.

There are two other symptoms occurring early, to which only a few of the text books refer, but which are very frequent. These are, excessive irritability and restlessness. In children these symptoms are of less value, but in adults deserve more attention.

A virulent type of the disease with death on the third day may set in with a subnormal temperature and the temperature remain down. A slow pulse was present in one case, where with a temperature of 100 4-5 the pulse was 66.

Just as in pneumonia, cerebro-spinal meningitis may set in with catarrhal symptoms and coryza. Rarely paralysis or paresis may appear as early symptoms.

SYMPTOMS.

Rigidity of the Neck.—This was a very constant and early symptom of the series and was noted in every case but two (96 per cent.). This finding agrees with Koplik's experience in the New York epidemic, where he also noted its occasional absence in the severe fulminant type of the disease. Osler has found this rigidity of the neck absent in the pneumococcus meningitis.

All degrees of rigidity may be present, from the slight stiffness where the patient's chin cannot be made to touch the chest to complete opisthotonos, which was present in two cases. This rigidity may not be limited to the vertebral muscles, but may extend to the other muscles of the trunk and extremities and produce a general spastic condition.

Retraction of the Head.—Another very constant symptom in our series was "retraction of the head." This usually occurs with rigidity of the neck, but the latter may be present without the former. It was

noted in 83 per cent. of this series. It is frequently absent for the first twenty-four to forty-eight hours or more. In many cases attempts to straighten the head cause

(1) Pain referred to the neck and occiput.

(2) Dilation of the pupils; probably due to irritation of the cervical sympathetic. This latter symptom is useful in differentiating it from the retraction found in pneumonia and gastro-enteritis in children.

Headache is usually the first symptom of the onset. Headache is always an early sign and was reported absent in only one case of our series (98 per cent.). It is frequently general at first, but rapidly becomes localized in the occiput; and the pain extends down the neck and spine. Usually severe, it may be agonizing in character, and is frequently accompanied by giddiness.

Delirium is another frequent symptom and is often early in its appearance. It may be found within six to twelve hours of the onset; in other cases it does not appear till later in the disease. It was present in 60 per cent. of this series and showed all variations from the mild form with a little wandering only at night, to the active, violent form with constant tossing and restlessness. With the onset of profound stupor and coma, the delirium may disappear.

The mental condition of the patient in a severe case presents, within a few hours of the onset, a certain dull, dazed condition, which increases to a semi-conscious state in which the patient seems in a dull reverie, but from which he can always be aroused when addressed. Later profound coma makes its appearance, gradually deepening till all response to stimulation disappears.

Coma was recorded in 67 per cent. of our series. In the virulent fulminant cases profound coma may set in early and is always of grave prognosis.

Hyperæsthesia of the Skin is frequently found present, and is most marked early in the disease. From my personal experience it has been a very constant symptom, but disappears with the onset of profound coma. It is probably caused by an inflammatory irritation of the nerve roots. In this series of 46 cases it was noted present in 11, in 4 it was absent, and in 31 it was not reported at all.

Muscular Twitchings occurred in 30.4 per cent. of this series. No group of muscles seem to have been affected with any degree of constancy, but twitching of the arms and legs were most frequent. The muscles of the face and calves of the legs were also mentioned.

Convulsions.—General convulsions, as previously stated, are not uncommon at the onset and occurred in 10 per cent. of this series.

Though Koplik found them more frequent in children, in none of our cases were the children very young, eight years being the youngest. They may come on just before death. Coming on late in the disease convulsions always suggest the possibility of hydrocephalus, with a view to lumbar puncture.

Paralysis and Paresis.—Apart from the affection of the ocular muscles paralysis was not frequently seen, being present in only 6 per cent. of this series. One side of the face was most often affected, but a definite hemiplegia with aphasia may be seen. These cases may present the typical picture of cerebral hæmorrhage, but the associated leucocytosis and lumbar puncture will clear up the diagnosis.

Paresis may also occur in the face, or one or more extremities. Gowers explains hemiplegia in these cases as due to a focus of intense inflammation over the motor area of the brain.

Reflexes.—The finding of the reflexes, both superficial and deep, will vary according to the stage of the disease when the examination is made. In early cases the reflexes are usually present or increased but are apt to disappear later on. Strumpell found the tendon reactions absent in five of 32 cases; in three they disappeared to reappear in convalescence. Babinski's reflex may be present in meningitis and Koplik reports it in 4 of 25 cases in the New York epidemic. In our own series the reflex findings are very variable.

Kernig's Sign.—In 1882 Kernig of St. Petersburg found a symptom which he thought pathognomic of meningitis, namely, the inability to extend the leg when the thigh was placed at right angles to the trunk. Since his publication our findings have compelled us to modify this view and we must state that Kernig's sign is not pathognomic of meningitis, being found also in pneumonia and typhoid fever, and may be present at the very onset of any illness in young children, but is nevertheless a very valuable symptom of meningitis.

In this series Kernig's sign was present in 33 cases of 46 (71 per cent.) and was definitely absent in two cases (1 per cent.) and was not reported in the remaining 11 cases. It was frequently absent at the onset, and did not appear till from the 2nd to 5th day. Its duration is variable, the longest case showing its constant presence for 30 days. Kernig states it was present in convalescence, but in this series the symptom always disappeared at the onset of convalescence.

Of the two cases in which Kernig's sign was absent, one was a fulminant case which died in 18 hours and the other a mild form where the patient recovered.

Gowers in his last edition 1907 does not mention this symptom in his article on Epidemic Meningitis. As to causation—the theory that

the phenomenon is caused by an irritable condition of the posterior nerve roots leading to spasm of the muscular fibres supplied, seems most acceptable.

Special Senses.

Eyes.—Of the symptoms referable to the eyes, strabismus was most common and occurred in (19) cases of 46 (41.9 per cent). The external rectus was affected in 13 cases (26 per cent. while the other muscles were involved in six cases. (13 per cent).

Photophobia was reported in 10 cases (21.7 per cent.) and conjunctivitis in five cases (10.8 per cent). In three of these it was purulent. The meningococcus has been isolated from the conjunctival sac. Nystagmus was present in 5 (10.8 per cent) cases and ptosis in 3 (6.5 per cent). Inflammation of the interior of the eyeball seems to have been rare.

Changes of the optic papilla were seldom noted, only three cases of neuritis or of actual atrophy are recorded.

Ears.—The only symptom reported referable to the ears was deafness which occurred in eight cases of this series. In 6 (13 per cent.) otitis media was present either double or single. Deafness in the other two cases was unexplained.

Skin Rashes.—This series presents the usual varieties of rashes, including erythema, herpes, petechiæ and purpura.

Roseola like that which occurs in typhoid, and which is described by Stillé as so frequent in the Massachusetts epidemic, did not occur in any case of this series.

Glancing over the various forms, the most striking feature is the relatively frequent occurrence of purpura. In some one of its various forms, it occurred in 15 cases (32.6 per cent.). The frequency of its occurrence varies with different epidemics. In some it is conspicuous by its absence, in others, as in the Dublin epidemic of 1866-67, it was so frequent that the name "Malignant Purpuric fever" was given it. These cutaneous hæmorrhages vary in size from that of a pin-point to a 50c piece and several may coalesce and form large discolored areas. They are most frequent on the trunk and extremities and are said to occur in the most severe cases. In our series with a total of 15 cases with cutaneous hæmorrhages 13 died; although two cases with extensive purpura recovered. The ecchymosis usually appears early in the attack but in one case came out just before death on the 66th day of the disease.

Of the varieties of skin rashes, herpes appeared in 15 cases (32.6 per cent.) in 13 of which the lips, *alæ nasi* and chin were affected, but in

two cases definite crops appeared on the buttocks. Occasionally the rash is bilateral. Different epidemics show variations with frequency of herpes. Von Zeimsen found herpes more frequent in meningitis than in any other disease. Lichtenstein found it present in 26 of 29 cases, while Stillé and Sydow report it in only 6 of 32 cases. Herpes usually appears in the first five days, but there may be successive crops throughout the attack. The contents have been examined repeatedly without finding the meningococcus present.

Erythema is not uncommon at the onset, but may only last a few hours, to be followed by petechiæ. It was noted in three cases of this series. Taches cérébrales was mentioned in two cases.

Spleen.—The occasional confusion of meningitis with typhoid fever led us to note the condition of the spleen in this series. In only two cases was the spleen distinctly palpable, and one of these cases gave other signs of the condition being one of general septicæmia, when we would expect the large, soft spleen of that condition. In 34 cases the organ was reported not palpable, and in 9 cases the condition was not noted either way.

From these figures then we may conclude that a palpable spleen is extremely rare in epidemic cerebro-spinal meningitis, and, if present, suggests a general meningococcus septicæmia.

The Blood.—The examination of the blood in this series serves merely to emphasize the already existing data on the subject. All authorities agree on two points,—(1) that there is in the vast majority of cases a well marked leucocytosis at the onset and early in the disease; (2) that the increase is chiefly in the polymorphonuclear variety of white cells.

Of thirty cases in which a white cell count was made, 26 (86.6 per cent.) showed a leucocytosis of 10,000 or over. In 4 cases the white cell enumeration was below 10,000, varying from 8,400 to 9,000.

In those cases which become chronic we may see a gradual reduction to normal in the white cell count, so that we may infer that the leucocyte count is of definite value if taken early in the disease, but if taken only after the case has become chronic is of doubtful value. As to the prognostic value of the white cell count, I find that of nine cases having over 30,000 white cells, seven died and two recovered; which would suggest a more serious outlook where there was a high leucocytosis; however, the number of cases is too small to draw definite conclusions. Of the four cases with a white cell count below 10,000, two died shortly after admission and two recovered. The hæmoglobin and red cells show no constant variations.

Blood Cultures.—Osler reported the first case in which the meningococcus was isolated from the blood during life, and subsequently several have confirmed this finding.

This seems to be only exceptionally the case, and limited to that class of cases characterized as acute meningococcus septicæmia, unless our methods of culture are still faulty.

Urine.—The most evident fact apparent after glancing over the examination of urine of 38 cases of this series is the great frequency of retention. This occurred in no less than 12 cases (31.6 per cent.). It may occur as early as the first day of disease, hence the caution necessary in these cases. The retention usually gives place to incontinence. This was present in 15 cases (39.4 per cent.), and is especially frequent in those cases which become rapidly comatose.

The urine is of high specific gravity, 17 cases (44.7 per cent.) showed a trace of albumin; six cases (16 per cent.) showed sufficient sugar to reduce Fehling's solution, and one case as much as 1.54 per cent.

Blood was present in two cases and pus in three. One of the cases in which blood was present in the urine was conspicuous in having petechiæ and large purpuric spots on the trunk and extremities, evidence of a hæmorrhagic tendency.

Lumbar Puncture.—Quincke, who proposed the operation of lumbar puncture, did more to clear up the origin and diagnosis of this disease than any other. The examination of cerebro-spinal fluid chemically, bacteriologically and microscopically has afforded us much positive data for diagnosis; until at the present day no diagnosis of this disease with its protean manifestations can be accepted as absolutely positive during life, without lumbar puncture being performed.

The objects to be obtained from lumbar puncture are:—

- (1) To establish a diagnosis of meningitis.
- (2) To determine the nature of the meningitis present.
- (3) To relieve pressure caused by an excessive quantity of cerebro-spinal fluid.

In this series of 46 cases lumbar puncture was performed in 42 cases. In 36 (85.7 per cent.) the diplococcus meningitis intracellularis was found, sometimes in pure culture.

The fluid was always more or less turbid, in some cases being very purulent, and was usually under considerable pressure. Apart from the question of diagnosis, lumbar puncture is believed by many clinicians to be of undoubted value in the treatment of the disease in the early stages.

The case reports of this series were carefully examined with the object of finding out whether definite improvement did or did not

occur after lumbar puncture. In 16 cases the results were mentioned, and in 9 of these it was definitely stated that no relief followed lumbar puncture.

In seven cases there was improvement, described as rapid or marked in two cases, while the others are indefinitely described as "temporary relief followed," or "slight improvement in temperature and pulse, etc.", and so on, so that as a therapeutic measure I think we must conclude that lumbar puncture, even though it is repeated, is of little therapeutic value in the majority of cases, but that it is occasionally followed by definite relief of symptoms.

There is one condition however, in which lumbar puncture gives certainly brilliant results, and that is where we have an excess of cerebro-spinal fluid causing symptoms in the condition referred to as hydrocephalus. This usually comes on during convalescence, and may be recognized by the mental dulness, drowsiness, dilated pupils, more rapid pulse and, perhaps, convulsions.

Koplik has described another sign on which he places great emphasis, viz., a hollow tympanic note on percussion over the horn of the lateral ventricle known as MacEwen's sign.

These symptoms are usually rapidly relieved by withdrawal of cerebro-spinal fluid, but may return as the fluid re-accumulates.

We have had no opportunities in this series to corroborate these results in hydrocephalus.

Microscopical examination of cerebrospinal fluid in this disease shows us that the turbidity of the fluid is due to the presence of leucocytes, of which two varieties may be distinguished, (1) polymorphonuclears, which are present in large numbers in very definite preponderance over the second variety; (2) the mononuclears. As the case becomes chronic the mononuclears tend to increase and the polymorphonuclears to decrease, until later both forms may disappear and the fluid becomes quite clear. The primary object, however, of the microscopical examination of cerebro-spinal fluid is to discover the presence of the diplococcus, whose presence is necessary to render positive the diagnosis of epidemic cerebro-spinal meningitis. The characters of the organism and its methods of culture I leave to the bacteriologist to describe.

COMPLICATIONS.

In order of frequency the following complications were found in this series:—

Otitis media.	6	13.0 per cent.
Acute broncho pneumonia.	6	13.0 "

Arthritis.	4	8.7 per cent.
Acute purulent pericarditis.	3	6.5 "
Acute cystitis.	3	6.5 "
Mastoiditis	2	4.3 "
Hydrocephalus.	2	4.3 "
Chronic phthisis.	2	4.3 "
Bedsore	2	4.3 "
Furuncles.	2	4.3 "
Septicæmia	2	4.3 "
Acute endocarditis.	1	2.2 "
Parotitis (double).	1	2.2 "
Pyonephrosis.	1	2.2 "
Sinus thrombosis.	1	2.2 "
Cerebral abscess.	1	2.2 "

Of the above I would especially bring before your notice the arthritis, acute purulent pericarditis and parotitis.

Arthritis.—Both old and modern authors mention joint disease as a rather rare complication of cerebro-spinal fever.

Two definite forms may be found:—

(1) Group of cases characterized by pain, redness, swelling œdema, *i.e.*, the typical arthritis of any toxæmia which rapidly subsides without injury to the joint.

(2) Those cases which go on to pus formation, with all the characteristics of the septic joint.

Of the first group little may be said, they resemble the rheumatic joint in appearance, and both large and small joints may be affected, including wrists, elbows, hands, knees and hips.

Of the second group they point rather to a local manifestation of a general septicæmia.

Osler refers to a case where the meningococcus was isolated from pus of a joint and also from the blood stream during life.

In our series arthritis occurred four times (8.7 per cent), three of these in the knee joint and one in elbow. In one case the pneumococcus was cultivated from the pus of joint.

The other three cases rapidly subsided under ordinary treatment. Acute pericarditis gave no sign during life and was only revealed at the autopsy. Parotitis is a very rare complication of this disease.

Course and Termination.—The course of the disease in this series reveals examples of each of the various classical types mentioned in the literature—but that group of cases described as Fulminant or Foudroyante is very numerous. By this term we indicate those cases which

set in with serious symptoms coming on rapidly, with loss of consciousness, coma and death within a few hours or days. There were 14 of these in this series, and 16 lived less than five days. Mild forms have been rare.

Mortality.—The excessively high mortality of 71.7 per cent. for the series, as compared with 73.5 per cent. in the New York epidemic of 1905, shows how powerless we still are to cope with this disease, and how acceptable the results of therapeutic research will be. There is surely here an excellent field for work, which, whether it be along the lines of a therapeutic serum, at which Flexner is at present at work in the Rockefeller Institute in New York, or whether it be from the application of Wright's opsonic theory, as has been carried out in Dublin and in the Montreal General Hospital here, will be equally acceptable to the profession at large.

I take this opportunity to thank the management of the Royal Victoria and the Montreal General Hospitals for the use of the records of these institutions.

RENAL TUBERCULOSIS.

BY

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During the past two years we have been favoured with the opportunity of observing a number of cases of tuberculosis of the genito-urinary tract. These cases comprise a number of cases of tuberculous epididymitis and orchitis, two cases of tuberculosis of the seminal vesicles and prostate, several cases of tuberculosis of the kidney, discovered post mortem and forming part of a generalized tuberculosis, and finally 12 or 13 cases of tuberculosis of the kidney which deserved clinically, at least, to be considered primary in the kidney. They represent the cases which have occurred in the wards of the Montreal General Hospital during the period mentioned, with one or two cases which have occurred elsewhere, and it is these cases to which I wish to call your attention.

One case, where the symptoms pointed to a tuberculous cystitis, and where tubercle bacilli were demonstrated in the urine, was not more carefully examined; we have therefore excluded it from this series, though it is not improbable that the case also would have corresponded with the remaining twelve where a sufficiently thorough examination was carried out.

To place our deductions as quickly as possible before you let me first detail the method of examination we have followed, the results we have obtained from such examination, and finally, those conclusions which we feel justified in making as a result of these findings.

We believe that we have received great assistance in the diagnosis of these conditions through the use of the cystoscope and ureteral catheter and have employed them in all the following cases, and it is more especially in regard to the use of these instruments that I wish to ask your attention. The cystoscope alone has rendered us useful service, but, except in one case, we have also separated the urines by catheter. Where the bladder has been extensively involved this has not been easy, the bladder has been extensively involved this has not been easy, but it has been simpler in the earlier cases, and it is in these early cases, when an early diagnosis is of vital importance and when diagnosis under our present methods is difficult if not impossible, that this has rendered us most signal assistance.

You know it is now fairly well established that in health each kidney secretes a urine almost identical with that of its fellow. This is empirical, both from animal experiment and from a large number of cases observed clinically. On the other hand, when one kidney is diseased we find the functions of that organ affected; its secreting power lowered, and the urine consequently of poorer quality than that of its fellow kidney. As I hope to show you in the following cases (V and XI), it requires destruction of but a small amount of kidney tissue to affect a change in the urine.

The functional activity of the kidney we measure by comparing the two urines obtained by catheter as to their acidity, specific gravity, quantity of urine present, presence of albumen, quantity of sugar present after the injection of phlorizin, and the depression of the freezing point. In addition, careful microscopic examination is invaluable.

Let me illustrate by taking a normal case, a case of floating kidney. The common catheter urine, and the urine from the right and left kidney compared as follows:—

TABLE I.

	COMMON.	RIGHT.	LEFT.
Reaction :	Acid.	Acid.	Acid.
Sp. G.	1010	1011	1011
Urea :	.8 per cent.	.8 per cent.	.8 per cent.
Albumen :	0	0	0
Sugar :	0	0	0
Microscopic :	Epithelium.	Epithelium.	Epithelium.

All three are practically identical—or, take a case of nephritis:

TABLE II.		
	RIGHT.	LEFT.
Reaction :	Acid.	Acid.
Sp. G.	1037	1037
Urea :	.2 per cent.	1.8 per cent.
Albumen :	A trace.	A trace.
Sugar :	1.25	1.00
Freezing point :	-1.8°	-1.9°
Microscopic :	Hyaline casts.	Hyaline casts.

The differences present are evidently errors in manipulation and estimation, as they vary now on one side now on the other.

In the first instance both kidneys were normal, in the second both equally diseased. Now, let us apply this hypothesis to the following cases:

Case I.—Male, æt. 40. (Dr. Armstrong), 23rd February, 1907. He had been ill three years, the earliest symptom being hæmaturia. About one year after the onset his left epididymis became nodular. He was emaciating. Pus blood and tubercle bacilli were found in his urine. We could not determine whether his bladder or kidneys were the site of the disease. Cystoscopic examination cleared the picture. An ulcer was present about the left ureteral orifice and a comparison of the urines was as follows:

TABLE CASE I.		
	RIGHT.	LEFT.
	Clear.	Turbid.
Sediment :	Mucoid.	Purulent.
Sp. G.	1009	1004
Albumen :	—	Present in quantity.
Urea :	1.6 per cent.	.5 per cent.
Microscop.	Epithelium : Few blood cells.	Pus, blood, tubercle bacilli.

The left kidney was indicated and operation confirmed our opinion.

This patient died some months later of a miliary tuberculosis. The autopsy showed that the original focus of disease had been removed with the kidney as the lesions present were all of the acute miliary type and no focus comparable in age with that in the kidney could be discovered on careful search. This would support the view that not only does the kidney play an important part in tuberculosis of the genito-urinary tract, but that it may be the primary focus in the body.

Case II.—Female, æt. 39. (Dr. Elder) December 18th, 1905. For six to eight weeks she had suffered with pain in the back. She was

emaciating. Her urine contained pus but no tubercle bacilli. A mass could be felt in the abdomen, right sided. The nature of the pyonephrosis could not be determined. The cystoscope showed an ulcer about the right ureteral orifice and this suggested tuberculosis. The urines were compared as follows:

RIGHT.		TABLE CASE II.	LEFT.
Reaction :	Acid.		Acid.
Sp. G.	1015		_____
Urea :	1.6 per cent.		1.8 per cent.
Albumen :	Present.		A trace.
Sugar :	0		Present.
Microscop.	Pus in considerable quantity, no tubercle, many cocci.		No pus, no bacilli.

Nephrectomy was performed, and a large pyonephrotic kidney removed. Microscopical examination proved this to be tubercular.

Case III.—(Dr. Finlay). Was a patient (male) suffering from pulmonary tuberculosis, and who developed hæmaturia. Bacilli were found in the urine and separation of the urine showed both sides to be affected.

Case IV.—R., male, æt 35. (Dr. Armstrong). Dec. 26, 1906. Had suffered severely from frequency for six months, also from pain in the back, pain on micturition and loss of weight. Blood, pus and tubercle bacilli were present in the urine. This was a difficult case as the bladder held but little fluid and the patient suffered severely, yet without a minute examination we could not tell where the site of the disease was, indeed, the patient had come some distance in order to have the lesion localized if possible. The cystoscope showed an ulcer about the left ureter, and a severe cystitis. The urines were compared as follows:—

RIGHT,	TABLE CASE IV.	LEFT.
Reaction :	Acid.	Neutral.
Sp. G.	1025	1008
Color :	Yellow.	Pale.
Urea :	1.7 per cent.	.3 per cent.
Albumen :	A trace.	Large quantity.
Microscop.	Calcium oxalate xtls. few pus cells.	Pus in quantity tubercle bacilli.

Evidently the left kidney was indicated.

Nephrectomy gave us a well marked tubercular kidney (marked IV). The patient has improved wonderfully, though his bladder still causes him some inconvenience.

Case V.—Male, æt 22. (Dr. Armstrong), 9th February, 1907. This patient had suffered from frequency for eight months. He had lost weight. Seven months after the onset his left epididymis became swollen and tender. His urine contained pus and tubercle bacilli. Cystoscopic examination showed no ulceration in the bladder, but distinct œdema about the left ureteral orifice with the presence of one or two doubtful tubercles. The urines were compared as follows:—

TABLE CASE V.

COMMON.	RIGHT.	LEFT.
Reaction: Acid.	Acid.	Alkaline.
Color: Pale.	Clear.	Turbid.
Sediment: Flocculent.	Mucoid.	Flocculent.
Sp. G. 1015	1017	1013.
Urea: ———	2.2 per cent.	1.3 per cent.
Freezing Point: ———	-1.3°	-9°
Microscop. Pus, tubercle bacilli.	Epithelium, no bacilli.	Blood, pus, tubercle bacilli.

We were able to locate the disease on the left side and state the right side to be normal. As may be seen the disturbance in function was but slight. Nephrectomy gave us a kidney similar to *Case XI*, where but one calyx was affected and not more than 8 c.c. of the kidney tissue involved, in fact, it is worthy of some remark that so small a lesion could so seriously affect the renal function.

Case VI.—McD., male, æt 40. (Dr. von Eberts) 23rd February, 1907. This patient suffered severely from pain in the back, frequency and pyuria. He had lost weight. A small mass was indistinctly palpable in the right side of the abdomen. The cystoscope showed a normal left ureter, but no sign of the right could be found. The left was catheterized, and the urines so obtained, compared as follows:—

TABLE CASE VI.

COMMON.	RIGHT.	LEFT.
Color: Turbid.	Turbid.	———
Reaction: Acid.	Acid.	Acid.
Sp. G. 1025	1010	1010.
Albumen: Present.	Present.	0
Microscop. Pus.	Blood, pus, tubercle bacilli.	No pus, no blood.

The right side was indicated. Operation gave us a hard, small, fibrosed, tubercular kidney (marked VI). The point of interest here lies in the ureter which was a hard, firm cord (with very small lumen), as thick as a No. 15 E sound and stretched very taut, pulling the kidney down and the side of the bladder up. The small lumen and the displacement due to the tension accounted for the difficulty in locating the orifice.

This patient was relieved of his symptoms and gained greatly in weight. He has of late, however, escaped observation.

Case VII.—N., male, æt 60. (Dr. Shepherd) 30th October, 1906. He had suffered from hæmaturia for two years and from frequency and dysuria for a shorter period. He too had lost weight. His symptoms pointed to a cystitis. The cystoscope showed a small slough and an ulcer on the left side of the bladder. We made a diagnosis on the presence of tubercle bacilli, of tuberculous cystitis.

The patient was treated by tuberculin under Dr. von Eberts (with observations as to his opsonic index) with very marked improvement. In February, four months later, a cystoscopic examination showed no ulceration present. Bacilli were, however, still present, and we now came to the conclusion, which we should have arrived at in the beginning, viz., that the disease was in the left kidney rather than in the bladder. The comparison of the urines here is as follows:—

TABLE CASE VII.

	COMMON.	RIGHT.	LEFT.
Color :	Turbid.	Clear.	Turbid.
Sp. G.	1025	1027	1025
Urea :	2.5 per cent.	2.6 per cent.	2.3 per cent.
Albumen :	Present.	—	—
Microscop.	Pus, blood, tubercle bacilli.	No pus, no blood.	Pus, blood, tubercle bacilli.

Case VIII.—C., female, æt 24. (Dr. von Eberts) 18th February, 1907. She had suffered for one year with pain in the left side, pyuria and the gradual loss of weight and strength. A mass was palpable in the left side. The left ureteral orifice was ulcerated, the urines as follows:—

TABLE CASE VIII.

	COMMON.	RIGHT.	LEFT.
Reaction :	Acid.	Acid.	Acid.
Color :	Turbid.	Clear.	Very turbid.
Sp. G.	1013	1022	1007

Urea :	1 per cent.	2 per cent.	.5 per cent.
Albumen :	A trace.	A trace.	Large quantity.
Sugar :	—	Present.	None.
Microscop.	Pus, tubercle, bacilli.	No pus.	Pus, blood, tubercle bacilli, diplococci.

At operation a large caseous kidney (marked VIII) was removed. The patient made an uninterrupted recovery, and when last seen, two months ago, was apparently in the best of health.

Case IX.—B., female, æt 35. (Dr. Elder) 4th September, 1907. This patient's illness began with pain in the side and attacks of renal colic, three months before observation. The usual loss of weight and pyuria were present. The bladder showed no ulceration, but definite cedema about the right ureteral meatus. The urines were as follows:—

TABLE CASE IX.		
	RIGHT.	LEFT.
Reaction :	Acid.	Acid.
Sp. G.	1007	1008
Sediment :	Flocculent.	Clear.
Urea :	1.2 per cent.	1.5 per cent.
Albumen :	Present.	
Microscop.	Pus.	No pus.

A diagnosis of right sided tubercular nephritis was made. Operation gave us an early tuberculous kidney (marked IX) with a small calcareous incrustation in the pelvis which accounted for the renal colic.

This patient is still under observation, and though all urinary symptoms have ceased, some obscure focus apparently still exists.

Case X.—K., male, æt 25. (Dr. Shepherd) 14th September, 1907. He had been ill with pain in the perineum for three months, during which time he had developed a periurethral abscess which was opened in the outdoor department. He subsequently developed some febricula and was admitted to the hospital where routine examination showed the presence of pus in the urine leading to a more careful examination. Oedema of the left meatus uretericus was found and the urines compared as follows:—

TABLE CASE X.			
COMMON.		RIGHT.	LEFT.
Reaction :	Acid.	Acid.	Turbid.
Color :	Turbid.	Clear.	Alkaline.
Sp. G.	1018	1030	1004
Urea :	2.3 per cent.	4 per cent.	.5 per cent.
Albumen ;	Present.	0	Present.
Freezing point :	—	-2.68°	—°
Microscop.	Pus.	Few blood cells.	Pus, few blood cells.

Tubercle bacilli were discovered and their presence confirmed by inoculating a guinea pig. The diagnosis of left sided tuberculosis was confirmed on nephrectomy. Progress up to the present has been excellent.

Case XI.—H., male, æt 21. (Dr. Armstrong) 14th August, 1907. He had noticed for a year severe attacks of hæmaturia. He had not lost weight or suffered otherwise. His urine, in addition to blood, contained some pus cells, otherwise physical examination was negative. The cystoscope showed a normal bladder, the ureteral catheter the following urines:—

	RIGHT.	LEFT.
Reaction :	Neutral.	Alkaline.
Color :	Pale, turbid.	Dark.
Sp. G.	1007	1025
Urea :	1.1 per cent.	3 per cent.
Albumen :	Present.	
Sugar :	X.	2 X.
Freezing point :	- .35°	-1.3°
Microscopic :	Pus, tubercle bacilli.	No pus or bacilli.

Evidently right sided tuberculosis.

Nephrectomy revealed a kidney which, on examination, showed but one small localized area diseased, the smallest focus of tuberculosis I have ever seen in a kidney. Again I wish to call your attention to the extent a small renal lesion has interfered with the kidney's functional activity. This patient has improved wonderfully though but two months have elapsed since operation.

Case XII.—R., male, æt 18, 3rd October, 1907. Nine months previous to observation he had noticed hæmaturia. This was followed by frequency and dysuria. He was emaciated. A mass was present in the region of the left kidney yet all symptoms have pointed to the bladder. This on examination is somewhat contracted and shows an intense cystitis, though not tubercular in character. Both ureteral orifices are obscured by inflammation and œdema. Tubercle bacilli are present in the urine. The lungs are also affected.

I add this case, believing that here too the lesion was primary in the kidney, as no source of the hæmorrhage is now present in the bladder, and the kidney is definitely involved. Absolute proof is, however, wanting.

Let me now summarize a few of the more important points in these cases.

Three cases were in women, nine in men.

It is noteworthy that in one case the first sign of disease was a periurethral abscess, chronic in character with the greenish pus common in tuberculous infection, but which healed rapidly. Its true nature is therefore undetermined.

In three cases an epididymitis was present. In all three the history would lead us to believe that this occurred subsequent to the original renal infection.

In Cases I, IV, V, VII and XII—six cases—the symptoms pointed to disease of the bladder rather than to the kidney, yet in all the kidney was found at fault, and the symptoms of bladder involvement either disappeared or definitely improved after removal of the affected organ.

In five cases the bladder wall was ulcerated in the neighborhood of the ureter from the affected side, and in others the ureteral orifice showed a definite œdema. (In one case cystitis was so far advanced as to quite obscure both ureteral orifices.)

Tubercle bacilli were found immediately in ten cases. In one case it was necessary to confirm our findings by animal inoculation.

Three cases were not operated upon—one because of the marked improvement which took place under the use of small doses of tuberculin; two because the involvement of the lungs at the time of observation forbade radical treatment.

Apart from the involvement of the epididymis and the periurethral abscess already mentioned, these two cases, III and XII, are the only instances in this series where involvement of other organs could be made out. As far as we can rely on clinical evidence this would point to a primary renal tuberculosis in ten cases. One of these cases came to autopsy, and the findings post mortem—acute miliary tuberculosis—showed no lesion comparable in extent or age with that of the removed kidney. This also would point in the direction of primary renal disease.

From these cases it would seem that primary tuberculosis of the bladder is rare, that it is infrequently infected from the prostate or genitals and that, as a rule, it is secondary to disease in one or other kidney.

On looking for confirmatory evidence, I must confess my surprise at the number of men who have been insisting on this very fact, and who regard tuberculosis of the kidney as a blood infection, and further, as frequently a primary tuberculous infection.

The evidence of these cases is in favour of both, yet our definition of a primary renal tuberculosis perhaps needs modifying. Clinically,

it is primary, pathologically, it is not unlikely that the true primary focus lies in some obscure lymph gland, mesenteric, peribronchial, mediastinal, where you will, and I feel that for the present we must assume this position.

Rosving, Israel, Casper, Zuckerkandl, Kummel, Ribbert, Orth, Vigneron, Tuffier, Fenwick, Kelly, Walker, and others, may be mentioned as holding similar views to those expressed.

Admit this position and the way of the surgeon becomes easier and, we think, the prognosis better. Early diagnosis is, however, necessary and we feel that the cystoscope and ureteral catheter offer us substantial aid in this respect. The cystoscope in demonstrating the presence of ulcers, tubercles or oedema about the meatus uretericus or the displacement of this orifice due to the contracting ureter, the separation of the urines in showing substantial interference with kidney function.

To express these remarks in a word, if we can diagnose early, a unilateral primary renal tuberculosis, and remove it, our prognosis should be favourable.

In the present instances we have purposely refrained from drawing conclusions as to the ultimate result, as we feel that only observation over an extended period can justify such conclusions. Up to the present our results are encouraging.

INFANTILE SCURVY.

BY

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"Fifty per cent. of the unrecognized cases of infantile scurvy seen in my consultation practice," said Heubner, "were already under the care of practitioners who were possessed of a literary knowledge of this disease." "For eight weeks," says Dock, of Ann Arbor, "a case with typical features of the above named disease had passed unrecognized through the hands of two physicians of considerable experience and more than ordinary ability."

The statements of the two clinicians, just quoted, prompt me to bring the subject of Barlow's disease before this Society this evening, by presenting first the reports of two cases, observed in the Royal Victoria Hospital, and then making a brief reference to the more important points in the diagnosis and pathology of this very interesting condition. The surgeon has, in some instances, regarded the complaints and signs

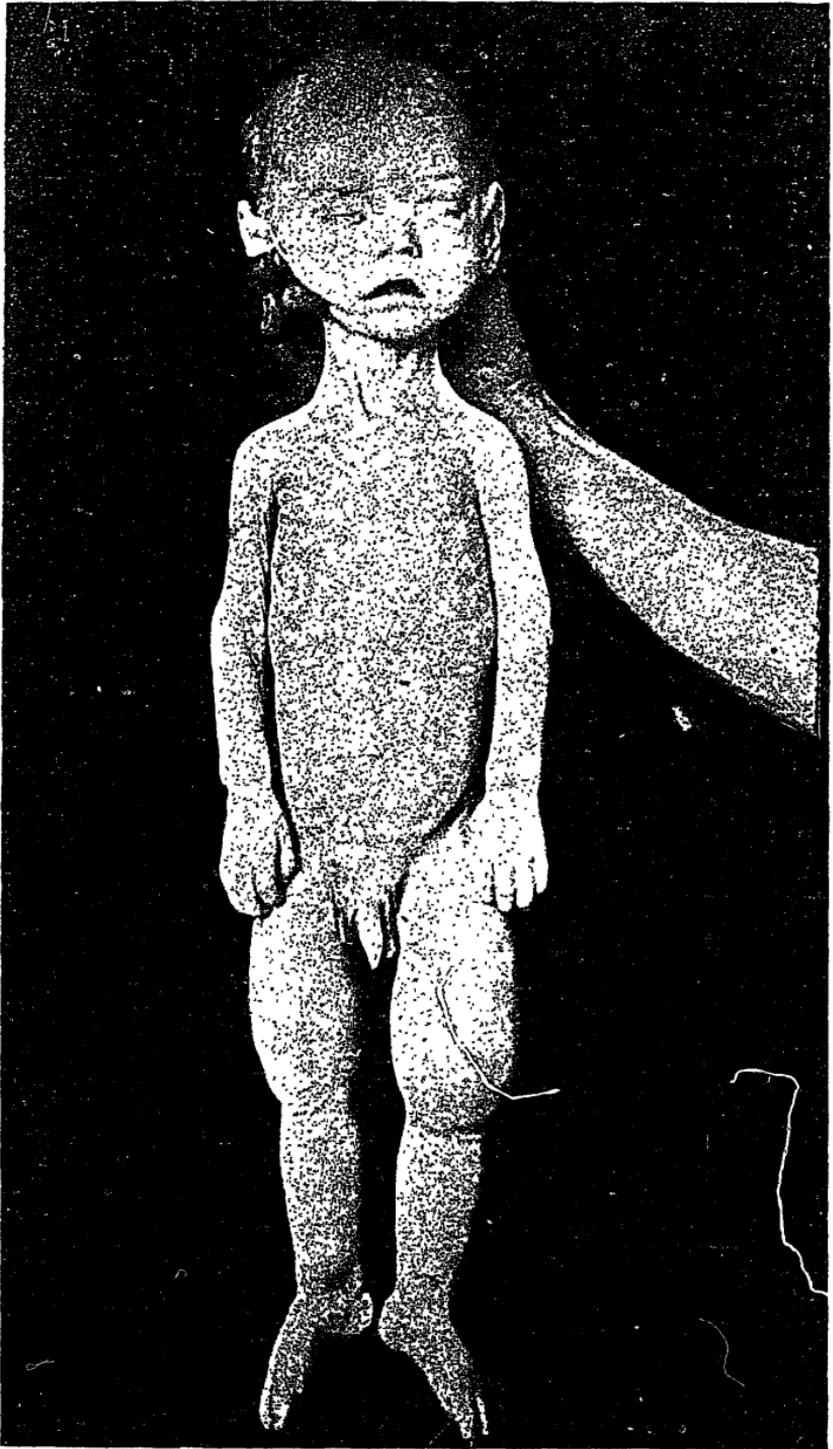
* Read before the Montreal Médico-Chirurgical Society, December 20th, 1907.

as explained by a fracture or a separation of the epiphysis, or attributed them to a sarcoma or osteomyelitis, for which operations have been undertaken. While the neurologist may be appealed to for a diagnosis of some cases, such as simulate neuritis or polio-myelitis, the aid of the ophthalmologist is sought particularly in those cases where the signs suggest a retrobulbar tumour or osteo-sarcoma of the orbit.

From the cases about to be described one may see how the eye symptoms dominated the picture; at all events the signs about the orbit compelled the advice of the specialist. It was after the late Dr. Buller felt satisfied that he could not explain the symptoms and signs present in one of his patients from the standpoint of ophthalmology that he requested me to see the child and to report upon his condition. Upon the examination then made our first case report is founded.

Case I.—A full term male child, eleven months old, was admitted to the eye department December 21st, 1903. In looking into his history we found that it had been found necessary to feed him artificially from his birth, and, as there was difficulty in finding a food that would agree, various changes were made. Modified milk, sterilized milk, Nestlé, Mellin, Allenbury and Wampole's foods were among those in requisition. The child at six months of age was very poorly nourished. At eight months a purplish discolouration with swelling appeared on the gums of the upper and lower jaws. It was at this time that his mother said he cut his first tooth. The gums did not bleed, except on one occasion, when they had been injured. The patient was very fretful, often crying as if in pain. At ten months the mother first noticed that he was much disturbed when his legs were handled, and about this time it was noticed that the ankles and thighs were swollen, the left more than the right. The swelling about the eye appeared about the same time, and, according to the mother, came on suddenly, with protrusion of the ball and duskiness of the upper lid. The arms were also swollen and purpuric spots were described upon the skin of both upper and lower extremities. The urine had been smoky for a week before the date of admission.

When admitted, the patient was found to present the appearances of profound anæmia and poor nutrition. The left eye was conspicuously prominent. There were swellings over the long bones, more marked towards the extremities. There was œdema, pitting on pressure. Manipulation of the limbs and pressure upon the swollen areas induced pain. Beading was seen bilaterally at the costo-chondral junc-



tion. The temperature was 99.6, the pulse 168. Examination of the blood confirmed the impression of the profound anæmia.

Erythrocytes.	1,380,000
Leucocytes.	15,600
Hgb.	16 per cent.

The urine contained a trace of albumen, a few red blood cells, but no casts. It was clear that the condition was one of infantile scurvy, and that the terminal stage was already reached. The patient died on the following day.

The autopsy findings were of special interest, and, as far as I can ascertain, this examination was the first of the kind made in Montreal. I am indebted to Dr. Adami for an account of his findings, which are here summarized.

In the soft parts, there was found but little to detain one. The lungs and heart, the pleura and pericardium, the peritoneum and meninges were free from signs of hæmorrhage. The spleen was slightly enlarged: the liver fatty, the kidneys congested, and, on microscopic examination, the secreting cells of the convoluted tubules presented a well marked cloudiness. In the soft palate a small extravasation of blood was discovered, while the gums of the upper jaw were swollen and reddened. The chief interest, however, in such cases centres in the condition of the bones and periosteum. In the left orbit a large blood clot was found beneath the periosteum, displacing the eye downwards and forwards. On cutting through this clot centrally, it was pale, while peripherally of a blue-black, apparently due to a comparatively recent hæmorrhage. The heads of the ribs were deeply congested and reddened, macroscopically. Upon cutting into the swelling of the right thigh, the tissues were moist and cedematous and an extensive superiosteal hæmorrhage was found, stripping off the greater part of the periosteum, leaving the bone rough beneath. In the joint itself only a few drops of clear fluid were found. "The epiphyseal cartilages were thick, the line of ossification showed as a thin blue line, but there appeared to be no excessive congestion in the neighbourhood. From the knee to the ankle the periosteum was lifted from its place both anteriorly and posteriorly by a recent blood clot." This description applies to the left leg as well, only the signs were, if possible, more widespread and pronounced. (We regret that the fire in the Medical Building robbed us of this rather unique specimen afforded by the left leg.)

Some portions of the ribs were preserved in the Royal Victoria Hospital, and the findings, microscopically, which I have made out with Dr. Klotz, are as follows:—

In a longitudinal section of a rib at the chondrocostal junction one observed that there was a considerable irregularity in the arrangement of rows of cells at the area of normal bone formation; the marrow substance and cartilage passed rather abruptly the one into the other; the marrow was not rich in cells, but rather fibrous and apparently wasted; there were hæmorrhagic areas, both in the bone marrow and beneath the periosteum, which was separated from the bone. A specimen taken from the lower end of the right femur showed, microscopically, this rather abrupt transition from cartilage to bone marrow.

At the autopsy, then, this case showed the characteristic extensive subperiosteal hæmorrhages in orbit, femur, tibia and ribs; and, microscopically, the irregularity of bone formation at the line of calcification—the newest part of the diaphysis—the close proximity of cartilage and marrow, the lack of lymph in the marrow, or rather a fibrous bone marrow (gërust-mark), and areas of hæmorrhage into the marrow both old and recent, while here and there beneath the periosteum of the rib, discoverable only by the microscope, small areas of blood extravasation could be made out.

Our second case was also found in the eye department, when Dr. Stirling made a request similar to that of Dr. Buller, concerning a case recently recommended to his service.

Case II.—On September 18th, 1907, a little girl of eleven months was recommended to the Royal Victoria Hospital for "protrusion of the right eye."

The mother stated that at seven months of age, the patient suffered an attack of diarrhœa and vomiting, reducing her considerably. Three weeks before coming into the hospital she had a "croupy" attack followed by a cough. For two months the child's lower extremities were sore. She cried when moved or when bathed, but when undisturbed she lay very quietly, for the most part, on her right side. Two weeks before coming into the hospital her mother said that her right eyelid became suddenly swollen, and that under cold compresses the swelling disappeared only to appear again, however, on the day before admission, more marked than before.

The child had never nursed. Cow's milk, modified cow's milk, Allenbury's food and malted milk had been used, while for eight months Eskay's albuminous food had been the chief nourishment.

When admitted the temperature was 100.3, the pulse 126, and the respirations 26. Pallor was marked. The right eye was displaced downwards and forwards, the upper lid being discoloured and swollen to four times its normal size. The cornea was clear and the fundus

normal. Over the body there was a reddish papular eruption, most marked in the face. On inspection of the patient it was seen that she preferred the right lateral decubitus, with her left thigh somewhat flexed. Any attempt to change her from this position provoked a cry. There was marked asymmetry over the thighs, the left being much larger, especially about the upper part, while swelling was noticed as well just above the knees. The swollen areas were tense and hard and tender. The upper extremities were but little affected. The incisors were already through. The gums were somewhat swollen and beyond a slight hyperæmia, apparently anticipating the eruption of other teeth, nothing unusual was noted. An examination of the blood confirmed the suspicion of a profound anæmia.

Erythrocytes	2,870,000
Leucocytes	13,600
Hgb.	26 per cent.

In coloured specimen, polychromatophilia and numerous nucleated red cells were found, while a differential count of 541 white cells gave the following result:—

Small lymphocytes	37 per cent.
Large lymphocytes	3 “
Polymorphonuclear	58 “
Transitional	1.5 “
Eosinophile5 “

From the condition found on examination, particularly when one considered the feeding of this patient, no diagnosis was so reasonable as that of infantile scurvy.

A change of diet was magical in the results. The swelling disappeared, the face regained its normal appearance, and in a few days (four or five) manipulation of the limbs was free and painless, and the cry of distress was no longer heard.

The pathology of infantile scurvy, or at any rate the history of the development of our knowledge of this disease, is written in the names under which the condition has been described. For instance, Möller's cases of “acute scurvy” described in 1859 are now believed to have been the same as infantile scurvy. To such cases in England, the term “hæmorrhagic periostitis,” or “periosteal cachexia” was applied. The paper by Cheadle in 1878 on “Three cases of Scurvy suprevening on Rickets in Young Children,” and, especially Barlow's communication in 1883, “On cases described as Acute Rickets, which are probably a

combination of Scurvy and Rickets, the Scurvy being an essential and the Rickets a variable element," expressed another point of view, and the term "scurvy-rickets" was for a time synonymous with Barlow's disease. From the two descriptions of the same condition expressing somewhat different views, the name Möller-Barlow's disease came into use in Germany. Now that a more general agreement concerning the essential points in the anatomy of the disease has been reached and the relation which it bears to scurvy seems as firmly established as the difference existing between Barlow's disease and rickets is clear, Fraenkel urges that the above name, common in Europe, be dropped and infantile scurvy be adopted. Looser argues from the point of view of the cause, the course, and the cure, that this disease is identical with scurvy in the adult, all the differences in clinical history and morbid anatomy finding ready explanation in the difference in the ages of the subjects.

Senator says that the essence of the disease consists in the profound anæmia present, and this symptom, he argues, is a result of the marrow changes. In a more recent communication by Looser one finds the following line of argument: All the pathologic changes observed in this disease (those already mentioned) may find their explanation in the hæmorrhages which occur. The anæmia, due to hæmorrhage; the bone changes attributable to the same cause, including the fibrous or thready marrow; the atrophy of the cancellous tissue and the fractures of epiphyseal separations.

Schmorl is practically at one with Looser regarding what may be considered as the characteristic anatomical changes, but his interpretation is different. After a very careful study of much material, both from the human subject and from animal experiments, he comes to a conclusion which may be expressed in the following terms:—The findings in Barlow's disease are hæmorrhages, the change of bone marrow into a tissue poor in lymph cells and blood vessels (lymph mark changed to Gërüst-mark) and atrophy of bone substance. These are co-ordinated and must be dependent upon one and the same condition which affects the bone vessels, the specific or special bone cells and the bone forming cells. What "form of evil" this is which brings about these changes in the present state of our knowledge one cannot say,—most likely, however, one identical with scurvy.

The Diagnosis.—We began by quoting authorities to show that a literary knowledge of this disease was not sufficient to enable one to make a diagnosis. The same may apply, however, to almost any disease, and one should be more than ever awake to disease in its early stages

if the best would be done for one's patients. While one knows that a high percentage of infants, artificially fed, do not become scorbutic, one knows, on the other hand, that it is rare, indeed, to find a *nursing* child having such symptoms, although a few such cases are reported on good authority. The feeding then is most important diagnostically. Again it is well to remember that signs of this disease do not come on suddenly. It is true that in one of our cases the mother maintained that the eye swelling came suddenly; others have reported such observations. A fit of crying or coughing may readily bring into evidence what was already partly developed, yet unobserved. Another feature is that the temperature is unusually low, or but slightly elevated, while a purpuric eruption is rare and even when present not usually well marked. The anæmia is usually profound when the swellings are advanced for this means great loss of blood if nothing more.

The two cases reported in this paper afford us striking examples of this disease. The etiology so common was altogether favourable for the development of the signs and symptoms. It is thought that cases of infantile scurvy are rare. We are convinced that such cases as these are rare, but it is not at all likely, considering the great number of children who are artificially fed, from whose diet "fresh constituents" are excluded, that, early or only partially developed cases are more frequent than would appear from cases reported.

It is now some years since Dr. Gee pointed out that hæmaturia occurred in infantile scurvy. More recently, however, it has been attracting more attention and several writers on both sides of the ocean have remarked upon hæmaturia as an early sign of value in this disease. In the Pediatric Society's report on 379 cases published in 1898, only 22 cases were recorded as having hæmaturia. A very much larger percentage is reported by Still in a group of 34 cases, where 60 per cent. of the patients had blood in the urine.

In closing these remarks on the diagnosis of infantile scurvy one would urge that the anæmia, the restlessness or fretfulness when handled, the presence of blood in the urine and sometimes unaccountable blood in the motions, when taken together or singly, should lead one to look carefully to the food the child is taking, and such signs should make one suspicious of early scurvy. The individual resistance may in part explain the fact that such cases do not become pronounced, while, at the same time, it is not unlikely that the food is changed as the child grows older in time to prevent the development of the marked clinical features of the disease.

The study of bone lesions has been greatly aided by the X-rays, and it is claimed by E. Frenkel and others that the fine structural changes

seen in the bones in infantile scurvy may be recorded by skiagraphy and interpreted upon the plate. Fränkel describes, as a constant finding, especially in the lower extremities, both in the bones of the living and in preparations after death a peculiar characteristic shadow of varying breadth in the most recent zone of the diaphysis. This shadow is broader in the middle or centre of the zone, and diminishes laterally. In this place where the shadow is broad there is such a tangle of bony trabeculæ calcium and bone debris, blood and blood pigment that the shadow is broader here. Laterally these elements are not so numerous and hence the shadow is less pronounced and weakened. All other findings with these rays are claimed by Fränkel as inconstant.

In our two cases we have made a study of skiagrams and beyond confirming the increased density over the area of the clot or subperiosteal hæmorrhage we must admit we are unable to confirm the rather enthusiastic observations of Fränkel on the use (diagnostic) of X-rays in this disease. We are not unmindful, however, of the fact that such work as this requires a most careful technique and a wide experience in the observation of shadows cast by the bones of a child of a few months.

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T H E

Montreal Medical Journal

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

EDITED BY

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No. 2.

MEDICAL DEVELOPMENT AT KINGSTON.

Queen's University has, within the last few days, celebrated with befitting ceremony the opening of new laboratories in connexion with the Medical School. An admirable inaugural address was delivered by Professor Barker of Johns Hopkins, and representatives from McGill, Professors Wesley Mills and Adami, from Toronto, Dean Reeve and Professor Macallum, took part in the celebrations. The occasion was of interest, not merely as marking a distinct advance in the development of the Kingston Medical School—an advance which Montreal cannot but cordially appreciate—but also as marking a new era in the relationship between the provincial government of Ontario and the University.

For many years past, through the activity more particularly of Dr. W. T. Connell, Professor of Pathology, and Dr. Knight, Professor of Biology and Physiology, the University has performed public services of no mean order in Eastern Ontario. Professor Knight especially has made a long and most valuable study of the food of fresh water fishes, and the effects of saw-dust upon the fish development. Professor Connell has been many-sided in his activities: in bacterial diagnosis, the study of epidemics, and the analysis of water and foods, and not least in connexion with the provincial dairy school, and the

study and prevention of bacterial contamination in the cheese industry. Recognizing these public services the Ontario government made a grant of \$50,000 to the Medical School towards the building and equipment of adequate pathological, bacteriological, and biological laboratories, and with a remarkable economy the University has succeeded in building and furnishing a set of laboratories at once commodious and excellently adapted to their respective purposes. The one talent given to her has been used to the fullest advantage.

Queen's is to be congratulated most heartily upon gaining this much needed increase to its equipment, and upon the means whereby it has achieved it. The enthusiasm that has animated the University of late years, and the loyalty displayed by all connected with it, from the Principal down to the youngest undergraduate is admirable. Despite lack of means, and despite the non-existence of wealthy alumni or benefactors, she has managed during the last few years to add greatly to her buildings, and the way in which her alumni have come to her aid is an example to all the other Universities of the country. They have, however, done so much, that the Medical School could not look to them for aid. Under these circumstances there is a certain poetic justice in the public services of the staff becoming recognized and turned to the advantage of the school. With such a spirit we cannot be surprised that the University is able to increase the number of her students, and to hold her own manfully against her wealthier Ontario rival, abundantly maintained as that is by provincial funds. With such a spirit as she now exhibits, and with sound ideals of University life, no one interested in education can but wish Queen's continued prosperity, and recognize the useful part played by her. As a Medical School we must regret that the hospital facilities are disproportionate. As at Ann Arbor the deficiency in clinical material must be made up to some extent by more thorough grounding in the ancillary branches of the course, and notably in the laboratories. It is here that the new building assumes so high an importance for Queen's.

DR. E. P. LACHAPPELLE AND LAVAL UNIVERSITY.

We cordially congratulate our colleagues of the Medical Faculty of Laval University, Montreal, upon the wisdom they have shown and the honour they have done themselves, in appointing Dr. E. P. Lachapelle as Dean, in succession to Dr. Rottot who has resigned the post, worthily held, if we mistake not ever since the foundation of the school. No medical man of our generation in this Province has devoted himself

so disinterestedly, for so long a period, or in so many different directions to the promotion of the health and well-being of his fellows as has Dr. Lachapelle. We say this freely despite the fact that we have not always been at one with him in matters of policy. To him more than to any other is due the establishment of the Provincial Board of Health, over which he has presided for now close upon twenty years, with steady increase in the power and efficiency of the institution; to his energy Notre Dame Hospital owes its existence and its expansion, and to him very largely is due the development of the technical training of the nurses, religious as well as lay, for the French portion of our community. Coming to matters more immediately related to professional life, for many years he presided with distinction over the College of Physicians and Surgeons of the Province. This is a record of public work difficult to match, a record that assures Laval that its new Dean will, with his ripe experience, devote himself loyally and successfully to the promotion of the best interests of its medical school.

RETIREMENT OF DR. ROTTOT.

Dr. Jean Philippe Rottot, who has just retired from the position of dean of the medical faculty of the University of Laval, has had a long and distinguished career. It is with great regret that the governing body of the University part with his services. Although Dr. Rottot was one of the leading French practitioners for many years, he always devoted a great part of his time to patriotic enterprises. He was one of the most prominent figures in the wards of Notre Dame Hospital; and, although refusing all public positions in the gift of his fellow-citizens, was a close follower of all political events touching the well-being of Canada. Dr. Rottot was born at l'Assomption in the year 1825, and received his degree from the College of Medicine and Surgery of the Province of Quebec in the year 1847.

Few men have had a more distinguished career in their profession than Dr. Rottot, and few have brought more honour than he upon their race and nationality.

THE UNIVERSITY CLUB.

Montreal will have its university club in operation by the first of May, when the organization will have passed from theory into fact. For twenty years there has been discussion. Now there is a club, and the reproach is removed that there was no place where all university men could meet together. A sufficient number of members has joined the

club to ensure its success. Sixteen universities are represented in the membership, but less than one quarter of the university men in Montreal have signified their adherence. The University Club will only fulfil its complete function when the names of nearly all eligible members are found on its roll and the members themselves within its rooms. With the pressure of work many men in the universities are strangers to each other and even members of the same faculty too infrequently meet together. This is especially true of members of the medical faculty and profession. They may now meet upon common ground and it is an obligation upon all to seek membership in the club.

The students of the University of Pennsylvania Medical School have formed an organization the purpose of which is to acquaint the undergraduates with the workings of the American Medical Association, after which it is very closely modeled. The various student societies take the place of the State organizations and elect members to a House of Delegates which transacts all the business of the association. An annual meeting is held at which papers are read by chosen members thus encouraging original research and a scientific spirit. The organization is named The Undergraduate Medical Association of the University of Pennsylvania and already has over two hundred and fifty members.

Hull's difficulties with regard to the epidemic of typhoid which is prevalent there, appear to be far from settled. The matter is generally considered fairly serious. As the authorities say that the water is pure enough when it enters the pipes, it is inferred that the danger must arise somewhere along the lines of water services. The Hull Waterworks Committee have made careful efforts to clean out the water mains, but the results have not been entirely satisfactory. One physician reports twenty-three cases in his practice.

The Committee of Management of the Western General Hospital announce that their new building is now completed and ready to receive patients, public and private. The building is fireproof and excellently equipped and contains a large number of private wards. Any physician, whether on the staff of the hospital or not, may attend his own patients in the private wards.

TORONTO GENERAL HOSPITAL.

According to a report in the *Toronto World* of January 16th, 1908, the list of appointments to the Toronto General Hospital staff has been completed and the recommendations presented to the Board have been adopted. A committee has been at work upon the subject for several months and the Hospital has adopted the report in its entirety. Following is a list of the names of the members of the staff:—

Surgery—Service in charge of Dr. A. Bingham—Senior assistant, Dr. Chas. Shuttleworth; clinical assistants, Drs. Walter Scott and Arthur B. Wright.

Service in charge of Dr. Alex. Primrose—Senior assistant, Dr. F. N. G. Starr; clinical assistants, Drs. Stanley Ryerson and S. Westman.

It is recommended that Dr. Clarence L. Starr be given the standing of senior assistant and attached to Dr. Primrose's service for the purpose of being available as an assistant for I. H. Cameron, the senior professor in surgery in the University of Toronto.

Service in charge of Dr. Herbert A. Bruce—Senior assistant, Dr. W. J. O. Malloch; clinical assistants, Drs. Warner Jones, John MacCallum and A. A. Beatty.

Medicine—Service in charge of Dr. Alex. McPhedran—Senior assistant, Dr. Andrew R. Gordon; clinical assistant, Dr. Wm. Goldie.

In charge of tuberculosis clinic, under Dr. McPhedran's service, Dr. Harold C. Parsons.

Service in charge of Dr. W. P. Caven—First senior assistant, Dr. John Fotheringham; second senior assistant, Dr. W. B. Thistle; clinical assistants, Drs. E. C. Burson and Joseph S. Graham.

In charge of the department for the treatment of functional neuroses, under Dr. Caven's service, Dr. D. Campbell Meyers.

Service in charge of Dr. Graham Chambers—Senior assistant, Dr. R. D. Rudolf; clinical assistants, Drs. Goldwin, Howland and G. W. Ross; clinical assistant in dermatology, Dr. D. King Smith.

Gynæcology—Service in charge of Dr. Jas. F. W. Ross—Senior assistant, Dr. Frederick Marlow; clinical assistants, Drs. W. B. Hendry, A. C. Hendrick, Ida E. Lynd and Helen MacMurchy.

Obstetrics—Service in charge of Dr. Kenneth McIlwraith—Senior assistant, Dr. Frederick Fenton; clinical assistant, Dr. J. A. Kinnear.

Eye Department—Service in charge of Dr. R. A. Reeve—Senior assistants (of equal rank), Drs. Chas. Trow, J. M. MacCallum and D. W. MacLennan; clinical assistants, Drs. Colin Campbell and W. H. Lowry.

Ear, Nose and Throat Department—Service in charge of Dr. Geo. McDonagh; senior assistants (of equal rank), Drs. D. G. Wishart;

Geoffrey Boyd and P. Goldsmith; clinical assistants, Drs. C. Mon Stewart and G. Royce.

Department of Anæsthetics—Dr. Samuel Johnston in charge; Assistant, Dr. Duncan Anderson.

Electrical Department—Dr. Chas. R. Dickson in charge; assistant, Dr. George Balmer.

The committee also recommended that all appointments lower than that of senior assistant should be probationary and subject to special review before the annual appointments are made; and that in observance of the provisions of the Burnside trust agreement, Drs. J. A. Temple and F. M. Grasset be appointed life members of the active staff without service.

The committee recommended that the following be added to the consulting staff. *Medicine*—Drs. John L. Davison, T. F. McMahon, W. H. B. Aikins, Allan Baines and John Caven. *Surgery*—Drs. Luke Teskey, R. B. Nevitt and N. A. Powell. *Obstetrics*—Dr. Adam H. Wright. *Eye and Ear Department*—Drs. G. Sterling Ryerson and G. H. Burnham.

The committee recorded its appreciation of the excellent character of the service rendered by the staff past and present.

Reviews and Notices of Books.

THE TREATMENT OF FRACTURES; WITH NOTES UPON A FEW COMMON DISLOCATIONS. By CHARLES LOCKE SCUDDER, M.D., Surgeon to the Massachusetts General Hospital, Lecturer in the Harvard University Medical School. Sixth Edition, thoroughly revised and enlarged, with 856 illustrations. Philadelphia and London: W. B. Saunders Company, 1907. Canada Agents: J. A. Carveth Co., Ltd., Toronto, Ont.

This work is becoming more and more a standard authority on fractures. The need of the Sixth Edition two years after the appearance of the Fifth is evidence of its popularity and general usefulness. It does not go as fully into the pathology of fractures, it does not discuss as fully the details of the displacements of fragments, the injuries to the soft tissues, to the nerves and to the blood vessels as does Hoffa in *Frakturen Und Luxationen*, or Bardenheuer in *Die Allgemeine Lehre Von Den Frakturen Und Luxationen*.

As stated in the preface, the original purpose of the book has been the presentation in concise and illustrated form of efficient methods

of treating the common fractures of bone. This purpose has been kept constantly in mind, and has been carried out with great ability and clearness. The book is essentially practical and is a lucid and safe guide in the treatment of fractures.

The wisdom of operating upon certain fractures is considered at some length in this edition. And while the advantages are made clear, the dangers of undertaking this method of treatment, particularly when joints are involved, as in fractures of the olecranon and patella are duly emphasized. The danger to life and limb is fairly stated, and in the author's opinion, it "should be undertaken only by surgeons of exceptional judgment and great skill who have at hand skilled assistants, and who can work under the most rigid aseptic conditions."

Those of us familiar with the unpublished history of these operations will be fully in accord with these views. New illustrations and new X-Ray pictures have been added. Especial attention has been directed to obstetrical fractures of the newborn, to fractures of the zygoma, of the malar bone, of the superior maxilla, of the head and neck of the radius, of the neck of the femur, and the carpal scaphoid; to unreduced dislocations of the elbow, to acromioclavicular dislocations, to pathological fractures, to old fractures of the radius and to Volkmann's contracture.

HUMAN ANATOMY; INCLUDING STRUCTURE AND DEVELOPMENT AND PRACTICAL CONSIDERATIONS. Edited by GEORGE A. PIERSOL. The J. B. Lippincott Company, New York, 1907.

This huge volume is the work of four professors of anatomy in American schools: Dwight of Harvard, McMurrich of the University of Michigan (now of Toronto), Hamann of the Western Reserve University, and Piersol of Pennsylvania. These have written on structure and development, whilst J. W. White, Professor of Surgery in Pennsylvania University, has dealt with the "Practical Considerations." We must say that the including of applied anatomy in a general text-book of systemic anatomy, although useful to the general practitioner, increases the burthen (already too heavy) of the student. A separate work in this subject is much preferable. Also histology, which is now usually taught outside the chair of anatomy by a specialist should be treated of in a separate text-book. Ordinary systemic anatomy is a sufficiently extensive subject for one book, and when others are added the work, as well as the subject, becomes unwieldy. The weight of the book alone would discourage a student, let alone the enormous scope of its contents. The book is well and clearly written, and magnificently illustrated. Most of the illustrations are original, though occasionally

an old, familiar friend is met with. Many of the illustrations are in colours. We are glad to see that the terms in use by English speaking anatomists and surgeons have been, for the most part, retained, the new nomenclature of the Basle Congress appearing in special type reserved for that purpose. We should advise, in case all the extraneous matter is retained, that the book be divided into sections as in Quain's or Muir's anatomies; for at present such a huge book will alarm students and deter them from the study of anatomy. There are no less than 2088 pages excluding 20 pages of introduction and contents. The illustrations everywhere are good, but especially illuminating in the sections of osteology and arthrology. The illustrations of the lymphatic system are also good and numerous. The text throughout is good, though in some parts rather too diffuse. The work is well printed and put out in the usually good style of the publishers.

F. J. S.

A TEXTBOOK OF PHYSIOLOGY. By ISAAC OTT, A.M., M.D., Professor of Physiology in the Medico-Chirurgical College of Philadelphia. Second Edition; revised and enlarged; 393 half-tone and other engravings, many in colours. F. A. Davis Company, publishers. 1907.

When the first edition of this work appeared it was reviewed in these columns and a favourable opinion of it expressed. The present edition represents a much improved book. It has been enlarged by the addition of 240 pages, mostly new matter. Some of the chapters have been practically re-written, others greatly changed, and all subjected to revision. The form in which the material has been cast is one that will appeal to readers and make the work of the student lighter—no small matter considering how much the medical student is expected to master these days. But at the same time one has only to look into a work of this kind to learn how much easier is the road to knowledge now than even ten years ago. If the student did little more after he had mastered the bare elements of physiology than look into this work with its teeming illustrations drawn from every source—if he faithfully studied these he must have a great help in acquiring that power to form mental pictures of organs, conditions and processes so valuable to every medical man; for the doctor cannot carry the laboratory around with him, and if it has not helped him in the mental process here alluded to its value has been but small, however fine the " tracings " he may have obtained, or however expert he may be in handling mechanical appliances. If Professor Ott's work served no other purpose than to furnish such a magnificent treasure-house of illustrations

it would be a valuable addition to any library. The author has taken great pains to bring his work up to date in every respect.

W. M.

PRACTICE OF MEDICINE. J. M. FRENCH. Third edition, 1907. Wood & Co., New York.

The success of this text-book can be judged from the fact that, since its first appearance in 1903, two additional editions have been necessary. The present edition is increased more than one half in size by new matter introduced. It is profusely illustrated by plates and drawings, some of which are original, but the majority of them are borrowed from other well-known sources. The style is good and the text reads easily. The author has had an experience of nearly twenty-five years as an instructor, and should be in a position to present a concise and attractive work for the practitioner and medical student.

Part I is devoted to the Principles of Medicine, under which such subjects as fever, inflammation, infection and immunity are briefly discussed. The sections on the Infectious Diseases, those due to animal parasites, and the Diseases of the Nervous System have been almost wholly rewritten, we are told. A more modern classification and nomenclature of animal parasites has been adopted. The introduction of the metric system of weight, measure, and temperature, with their equivalents in the English system, is worthy of imitation.

The article on Typhoid Fever is open to the criticism of many, from the fact that the author recommends the use of calomel in small doses at the onset of the disease, "for its antiseptic effect on the intestine." He also recommends salol for the same purpose. Another questionable statement is: "If the fall of temperature after a cold bath during the first week is more than 2.5°F ., the disease should not generally be pronounced typhoid fever." A special article is devoted to paratyphoid fever. The "fresh air" treatment for lobar pneumonia is strongly advocated. The bacillus of Afanassieff is accepted as the probable cause of Pertussis. The weakest sections are those on the diseases of the Blood and Nervous System. The last few pages are devoted to a very elementary description of the examination of the blood, sputum, feces and gastric contents.

C. P. H.

TRANSACTIONS OF THE FIFTH ANNUAL CONFERENCE OF STATE AND TERRITORIAL HEALTH OFFICES. The United States Public Health and Marine Hospital Service, Washington, 1907.

These transactions published by the authority of the Surgeon-General are a fresh indication of the increased attention which is given officially in the United States to matters of public health. The subjects dis-

cussed were: The sanitary supervision of milk supplies; the geographical distribution of malaria, and carriers of bacilli.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By JAMES M. ANDERS, M.D., Professor of Theory and Practice of Medicine and of Clinical Medicine, Medico-Chirurgical College, Philadelphia. Eighth Revised Edition. Octavo of 1317 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1907. Cloth, \$5.50 net; Half Morocco, \$7.00 net. Canadian Agents: J. A. Carveth & Co.

The seventh edition of this work has been out but two years; the issue of the eighth following so promptly upon the seventh, indicates that the book is popular. A certain rearrangement of the Animal Parasitic Diseases appears, and one or two new articles are added. The present reviewer questions the advisability of the term 'Abortive Pneumonia, which has been soiled by much ignoble use, and questions still more the existence of the disease; and the paragraph added in this edition upon Chronic Appendicitis without preceding acute attacks, leads to the conclusion that whatever disease or group of diseases is here described, the appendix has little or no share in their causation, and appendicitis is scarcely the term under which it should be described. This paragraph contains so many doubtful statements, such as this, that influenza may cause appendicitis, that its omission will not harm the next edition which may be confidently expected to be issued.

THE TOXINS AND VENOMS AND THEIR ANTIBODIES. By EM. POZZI-ESCOIT. Translated by A. I. COHN. John Wiley and Sons, New York. Price, \$1.00.

This is a handy little book of one hundred pages, giving very briefly the essential characters of the various toxins of cellular origin. The author has collated the main facts from many experimental studies.

In the first portion of the book a general oversight is given of the alkaloidal and bacterial toxins and the antibodies which are developed in the living organism. The various theories are briefly dealt with and a very good general review is obtained of what may be considered an extremely complex subject. In the latter half of the book various toxins and venoms are discussed as far as our knowledge to-day permits. The simpler experiments are also given.

This book can be recommended to those who have not the opportunity of becoming more familiar with the subject in the laboratory, but who are, nevertheless, desirous of keeping abreast with the progress made in the study of immunity.

BLOOD STAINS, THEIR DETECTION AND DETERMINATION. By MAJOR W. D. SUTHERLAND, of His Majesty's Indian Medical Service. Baillière, Tindall and Cox, London. Canadian Agents, J. A. Carveth & Co.

This book is dated September, 1907. It is new in other respects also. The question of blood-stains has not heretofore been so adequately treated. All methods which are of value for detecting blood and for determining its origin are fully described. The sections which deal with precipitins are of especial value. The book is full of interest. Cases are cited and incidents are recorded, which make the reading a pleasure. "Sutherland on Blood-Stains" is likely to become an authority.

COSMETIC SURGERY. By CHARLES C. MILLER, M.D. Oak Printing Company, 9 Wendell Street, Chicago.

A "foreword" is the sign of a silly book. Dr. Miller's Cosmetic Surgery is no exception, but fortunately the book is small. There are some new expressions in it, which collectors of abnormalities might like to have. Two are "featural surgery" and "elective surgery." One chapter is devoted to "the formation of the dimple." In view of the large number of silly people in the world who demand "elective surgery," Charles C. Miller may not be so silly as his book would indicate.

TRANSACTIONS OF THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS. Seventh Triennial Session, held at Washington, May, 1907. Published by the Congress, New Haven, 1907.

The volume opens with Osler's address on "the evolution of the idea of experiment in medicine." Dr. Barker follows with a paper on "neurological and psychiatric neuroses." Dr. Stengel describes "chemical and biological methods in diagnosis." Other contributors are Drs. Cabot, Bulmer, Musser, Stockton, Mayo, Munro, Jacobi, and Janeway. These names indicate the importance of the book.

INTERNATIONAL CLINICS. A quarterly of illustrated clinical lectures and especially prepared original articles, edited by W. T. LONGCOPE, M.D., Philadelphia. Vol. IV., Seventeenth Series, 1907. J. B. Lippincott Company, Philadelphia and London.

This volume of Clinics is one of the best of the series which we have had the privilege of examining in the past five years. It contains over 300 pages of freshly prepared material by more than thirty authors with nearly a hundred plates, tracings and figures. We note an article by McPhedran, of Toronto, on "The urgency of early diagnosis of

cancer of the stomach," and a reference to Morrow's work on negative venous pulse. The book has a usefulness which no physician can afford to disregard.

MEDICAL DIAGNOSIS. By CHARLES LYMAN GREENE, M.D. Second Edition revised. 7 coloured plates and 241 illustrations. P. Blakiston's Son and Company, Philadelphia. \$3.50 net.

This is a book of nearly 700 pages with 250 illustrations; yet it is easy to the hand and eye—thin paper limply bound, with side headings. The edition is the second. The first was issued only seven months ago. It is a most generally useful book, direct in statement, logical in arrangement, not a compend.

Medical News.

WESTERN HOSPITAL.

The annual meeting of the corporation and governors of the Western Hospital was held on Tuesday, January 21st, 1908. Mr. Peter Lyall, the president, occupied the chair. The following officers were elected:

Hon. Presidents.—Messrs. C. P. Smith and R. Hersey. President—Mr. Peter Lyall. First vice-president—Mr. Robert Bickerdike, M.P. Second vice-president—Mr. B. A. Boas. Treasurer—Mr. H. A. Hodgson. Secretary—Dr. George T. Ross.

Committee of management—Messrs. J. C. Holden, P. W. Trenholme, T. J. Rutherford, Thomas Gilday, J. T. McCall, John Murphy, Dr. Perrigo, J. Pitblado, C. W. Davis, Henry Birks, Milton Hersey, Dr. Hackett and W. J. King.

The medical board was re-elected.

Dr. George Ross, the secretary, submitted his report. Only six of the forty-two original chartered members had survived to see how the work begun thirty-five years ago had prospered. During the year the old hospital had been converted into a nurses' home and the new building was completed and opened to the public. The number of patients had increased by one hundred over the previous year, and outdoor consultations by five hundred, despite the fact that the active medical and surgical work was in abeyance during several months of the year.

As the average cost per day was \$1.46 for each patient, and as the cost of supplies had increased it had been found necessary to slightly increase the charge for private patients. Dr. Ross dwelt strongly upon the fact that increased efforts should be made to secure funds for the maintenance of the hospital.

The treasurer, Mr. H. A. Hodgson, said, that, although the property was very valuable it was unproductive, and the income from the endowment did not pay one-quarter of the annual interest on the \$40,000 mortgage. The balance required to clear off the new building and furnishings amounted to \$62,578. The receipts for the year had been \$20,184 and the disbursements had amounted to \$319 less.

Dr. F. J. Hackett, secretary of the Medical Board, stated in his report that in the indoor department there had been 772 admissions during the year. Of these 630 were from the city, and 92 from a distance. The death rate had been 5.9, but excluding those who had died within forty-eight hours after admission, the rate was reduced to 4.2. In the outdoor department the consultations had numbered 6,786.

ROYAL VICTORIA HOSPITAL.

The annual meeting of the Royal Victoria Hospital was held on January 28th. The fourteenth annual report was presented.

The number of patients admitted during the year was 3,398, a decrease of 46 from the previous year.

There were 1,994 Protestants, 1,071 Roman Catholics, 290 Hebrews and 43 of other faiths; 1,656 were free patients, 1,280 public ward patients, paying fifty cents and one dollar per day, and 462 private ward patients; 2,473 were residents of Montreal, and 925 came from districts outside of the city.

The total days of hospital treatment aggregated 81,902, as against 73,993 during the previous year, an increase of 7,909 days.

The average number of days' stay in hospital per patient was 24.10, as against 22.04 the previous year.

On the 1st January, 1907, there were 224 patients in the hospital remaining from 1906, and during the year 3,404 were discharged, of whom 1,897 were well, 1,002 improved, 165 not improved, 123 not treated, and 217 died. Remaining in hospital 31st December, 1907, 218.

Of the 217 deaths, 71 took place within 48 hours of admission.

The death rate for the year has been 6.81 per cent., or, if those dying within 48 hours after admission be deducted, 4.58 per cent.

The highest number of patients in the hospital on any one day was 260 on the 11th January, and the lowest was 199 on the 20th of May; the highest monthly average was 245, in January; and the lowest 209, in April; the daily average for the year being 224, as against 203 for the previous year, an increase of 21.

During the fourteen years that the hospital has been in existence, 36,524 patients have been admitted to the wards for treatment.

In the Out-Patient Department, the total number of patients treated was 4,156; the number of visits of these patients aggregated 27,399:—Medical, 9,379; surgical, 8,311; eye, 3,505; nose, throat and ear, 4,758; diseases of women, 1,446.

The ambulance made 1,128 trips.

The income for the year was \$168,381.04, while the ordinary expenditure amounted to \$146,610.09; the balance of \$21,770.95 being applied in reduction of the indebtedness incurred by the new buildings and other additions.

The total cost per day per patient has been \$1.79; the cost per day of maintaining each person in the hospital—staff, servants, all employees and patients—being 81 cents, a decrease of 4 cents from the previous year, and the daily cost of provisions for each person, 19½ cents, a decrease of 2 cents from the previous year.

THE ROYAL VICTORIA HOSPITAL.

Monthly report for December, 1907:—Patients admitted, 304; patients discharged, 306; patients died, 17; medical, 99; surgical, 122; ophthalmological, 20; gynæcological, 31; laryngological, 32.

Outdoor department:—Medical, 750; Surgical, 619; eye and ear, 263; diseases of women, 85; nose and throat, 366; total, 2,083. Number of ambulance calls, 102.

Yearly report for 1907:—Patients admitted, 3,398; patients discharged, 3,187; patients died, 217; medical, 1,044; surgical, 1,328; ophthalmological, 259; gynæcological, 433; laryngological, 334. Outdoor department:—Medical, 9,379; surgical, 8,311; eye and ear, 3,505; diseases of women, 1,446; nose and throat, 4,683; total, 27,324. Number of ambulance calls, 1,115.

According to the report of the medical superintendent of the General Hospital, 182 patients were admitted to the wards of the hospital during December and 181 were discharged. There were 19 deaths, seven of which occurred within three days of admission. The average daily sick in the hospital was 185, and the highest number on any one day was 203. Outdoor patients numbered 3,596. The ambulance made 102 runs in response to calls. The average number of visitors on visiting days was 316.

F. W. Goodwin, a prominent practitioner of Halifax, died on Wednesday, December 20th. He was a native of Baie Verte, and a gradu-

ste of Halifax Medical College, where he took his degree in 1885. In 1899 he went to England and received the usual qualifications. He was on the staff of the Halifax Medical College, where he lectured on therapeutics and materia medica. He was past president of the Halifax Branch of the British Medical Association and had also been the Secretary.

Dr. Frederick John Bradd, of Peterboro, died at Nicholl's Hospital, 28th December. The deceased was forty-eight years of age, and was born in Northumberland County. He received his early education at Cobourg University, and later on took a course in medicine at Toronto University, graduating in 1888. He had resided in Peterboro for the past ten years and was considered one of its most successful physicians.

Dr. E. J. T. Fisher died at his residence, 121 Spadina avenue, Toronto, December 8th, at the age of 64. He was a graduate of Victoria University and had been practising medicine in Toronto for forty-five years. Dr. Fisher had served as surgeon to the 10th Royals in the Fenian Raid.

Captain Charles Dickie Murray, of the Permanent Medical Corps, died at the military hospital in Halifax on December 12th. Dr. Murray was the son of the late Rev. Wm. Murray, and had practised medicine in Halifax before joining the army service.

Dr. Henri Larue, of Hull, died at Quebec. He had practised medicine in Hull for only a year. The late Dr. Larue was married to a daughter of Senator Gadbout of Beauce, and was a son of Hon. Mr. Larue of Quebec.

Dr. Philip J. N. Strathy, eldest son of Mr. H. S. Strathy, former general manager of the Traders' Bank, died suddenly at his home, 467 Spadina Avenue, Toronto, on Thursday, January 2nd.

Dr. Overton of Exploits, Newfoundland, died there on Thursday, January 2nd. The deceased was a graduate of Columbia University.

Dr. C. N. Stevenson, of Coaticook, died on December 15th. He had practised medicine there for some twenty-five years.

Dr. Richardson, of Canmore, surgeon to the Canadian Pacific Railway mines at that place, died on December 10th.

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF DRs. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

HEINEKE. "Rupture of the Pancreas." *Ueber Pankreasrupturen. Archiv. Klin. Chir.*, 1907, 84 Bd. 4 Hf.

Since Garrè drew attention to rupture of the pancreas a number of additional cases have been reported. Heineke reports 5 of subcutaneous injury to the pancreas, upon 4 of which he operated; of these 3 were isolated ruptures of the pancreas, while the other 2 were complicated by injuries to adjacent organs. In one, a 14-year-old lad who had been kicked by a horse, a tear was found in the serous coat of the liver; the stomach and intestines were intact. Upon the convexity of the spleen was a tear extending somewhat deep into the parenchyma. The spleen was removed. In the tail of the pancreas was a longitudinal tear about 3 cm. deep with very little bleeding. The wound in the pancreas was tamponned. The patient made a good recovery.

The second case was a man 44 years of age, who had been run over—the wheel passing over the left side of the abdomen. In this case neither the liver nor spleen was injured, but a longitudinal tear was found in the pancreas—there was but little bleeding. In addition there was found a tear in the jejunum. Intestinal and pancreatic tears were sewn. The man died 10 hours after in collapse. At autopsy a fracture of the 3rd to 7th ribs on the left side was found; also fracture of the pelvis and left hemothorax.

Rupture of the pancreas complicated by other serious injuries though rather more common than isolated rupture is still a rare injury—seldom observed at the operating table, and indeed infrequently found in the autopsy room. In the Pathological Institute at Leipsic, among 9,500 sections during seven and a half years only one case was seen. Indeed most of the cases reported in literature have been observed in the autopsy room. One might almost wonder that rupture of the pancreas has not been found more frequently in cases of traumatism to the abdominal wall when one remembers its transverse and exposed position lying directly across the bodies of the 1st and 2nd lumbar vertebræ. Recent experiences, however, indicate that hæmorrhage from these injuries is not great, and in many instances recovery follows the suturing and tamponning of the tear.

That recovery may follow very severe injuries of the pancreas is illustrated by the case of a man 34 years of age upon whom a mass of earth had fallen across his stomach and lower part of the chest. At first he was breathless and, he immediately suffered from severe pain in the region of the stomach—no vomiting. He was taken into the hospital 2 hours later. He then complained of severe abdominal pain—his breathing was short—great tenderness over the lower ribs on both sides, particularly the right. The abdomen was distended—great tenderness in the epigastric region—pulse good. The diagnosis of intra-peritoneal injury was not clear, particularly because of the association of the fractured ribs. The abdominal pain increasing more and more, and the distension becoming greater and vomiting appearing, operation was undertaken 4 hours after the injury under chloroform narcosis. Blood was found in the abdomen, but not in great quantity. Liver and spleen were not injured. After a long search a longitudinal tear was found in the gastro-hepatic omentum. Through this tear one came upon the pancreas: the gland was found completely divided, in the middle in front of the vertebra into 2 parts, the borders well-defined, and not particularly crushed—the bleeding was not great, only one spouting from the left half, the splenic vessels were not seen, and there was no fat necrosis. The bleeding artery was tied, the coagula removed and the two halves of the pancreas were united by 6 cat-gut sutures passed through the whole thickness of the gland. A drain and a tampon of sterile gauze were carried down the suture line. The man recovered and left the hospital well.

A somewhat similar case of complete transverse rupture of the pancreas was observed in the Leipsic Clinic a few years ago. Nineteen cases of isolated ruptures of the pancreas are collected. Of these 19 five were not operated upon, and all died. Of 14 operated cases 9 recovered and 5 died, although one of the late Prof. Mickulicz's cases died of lung complications 5 months later. Of the 4 others in 2 the tear was not found and the 3rd came too late, and was in too bad a condition for operation. It would seem that the prognosis in injury of the pancreas is good. All the cases that had been operated upon immediately with the nature of the injury recognized have recovered. The prognosis is bad when seen for the first time several days after the injury when the secretion of the pancreas has caused considerable alteration of the peritoneum.

The chief complications in injury to the pancreas would seem to be lung complications, hæmorrhage, and the escape of pancreatic secretion into the abdominal cavity. The danger from hæmorrhage is not great as has been already observed by Körte and Karewski. Even in com-

plete transverse rupture of the pancreas the hæmorrhage was not extreme. Associated ruptures of the spleen and liver may add considerable to the danger. The important indications in the treatment are to arrest hæmorrhage and prevent the escape of the secretion so far as possible. Untreated cases generally die from the 4th to the 8th day, death being preceded by vomiting, distension of the abdomen, constipation and symptoms resembling ileus. If operation is undertaken at this time, the nature of the condition will be made evident by the fat necrosis, the injection of the peritoneum and the bloody serous exudate present. A definite diagnosis of rupture of the pancreas is generally impossible. In most cases one can only diagnose a perforative peritonitis, which may be from the liver, spleen, pancreas, or some other viscus. The most important evidence in favour of the pancreas is the site of the trauma. Often it is a kick or a blow in the epigastrium. Garrè and Körte have pointed out that sometimes in isolated rupture of the pancreas there are comparatively few important symptoms during the first few hours. The pulse may be normal and regular—no shock—no vomiting, but after a few hours grave symptoms develop quickly. This free interval, however, is not constant. The symptoms may develop immediately after the injury is received. There appears to be only one symptom which permits of an almost certain diagnosis of injury to the pancreas, and that is, a collection of blood in the lesser omental sac. When the Foramen of Winslow is closed and the gastro-hepatic and gastro-phrenic omentum is not torn, as is not infrequently the case, the collection of blood in the lesser sac gives rise to a tumour in the epigastric region. Such a tumour rapidly developing after severe traumatism to the epigastrium, suggests the probability of injury to the pancreas.

Any part of the pancreas, of course, may be injured, but particularly that part lying immediately in front of the bodies of the vertebra.

As to the cause of fat necrosis, these cases have not thrown much light, and the question may still be asked whether the pancreatic secretion itself causes this change, or must there be in addition some other unknown agent at work?

Among the cases of pancreatic injury fat necrosis has been present in only a few. Truhart found that among 138 cases of injury to the pancreas, including gun-shot, and puncture wounds fat necrosis was present in 17. In 121 it was absent. As Truhart suggests the absence of fat necrosis in 121 cases may have been due to the short time of exposure to the pancreatic secretion, or in other cases, to the very rapid forming of adhesions walling off the secretion from the general peri-

toneal surface. In his view, fat necrosis results from the action of some ferment present in the normal pancreatic secretion.

G. E. A.

LEDUC. "The Electrical Sleep." *La Presse Médicale*, Feb. 27, 1907.

Translation from *The Journal of Advanced Therapeutics*, June, 1907. Granger.

Professor Leduc designates under this name "a sleep which is analogous to the sleep from chloroform anæsthesia; the subject lies motionless, incapable of voluntary movements, does not react to even the most painful stimulation, the respiratory movements, the heart action, and the reflexes alone persisting; this state is produced by action upon the brain of a certain form of electrical current; it can be maintained for several consecutive hours and it ceases instantly upon the withdrawal of the current."

"The current employed to produce this sleep is a special current the result of numerous experiments made by Professor Leduc at the medical school of Nantes, while studying the action of the various forms of electrical energy on the brain, spine, and nerves. It is a continuous current of low voltage which passes for a given time, ceases to pass, and again passes, the interruptions being at regular intervals. He found the best results were obtained with frequencies of 100 per second, and with the current passing for 1-10 of a period; that is, the current passes for 1-1000 part of a second 100 times every second."

"The heads of the animals were shaven and an electrode covered with several thicknesses of absorbent cotton soaked in a warm 1 per cent. solution of sodium chloride was applied well forwards immediately over the eyes." The second electrode was placed posteriorly over the lower end of the spine. The negative pole of the battery was connected with the head electrode. The current is turned on slowly and the state of electrical sleep is attained progressively, without a cry, without a movement on the part of the animal to indicate pain or excitement. The sleep was similar to chloroform anæsthesia excepting for the fact that the reflexes were not totally abolished. Major surgical operations were performed without producing any more reaction than if they had been performed under chloroform anæsthesia."

"Sleep was produced in the rabbit by using 6 to 8 volts, which gave 1 to 2 ma. in the intermittent; this would correspond to 10 to 20 ma. in an uninterrupted current. When the known necessary voltage was turned on at once the inhibition was sudden; the animal fell stiff upon his side; as a result of the generalised contractions, the respiration was suspended; after ten seconds the contractions ceased and relaxation

began; after fifteen seconds respiration became re-established, and the animal could be maintained in that condition for an indefinite period. One rabbit was kept in this state for 8 hours and 20 minutes. He survived and did not seem at all affected by this prolonged experience."

"When the experiments were terminated by suddenly withdrawing the current the awakening was instantaneous; in the majority of cases the animal immediately stood on its legs, looked quietly around him without any manifestation of pain, fear or fatigue. As soon as he was liberated he scampered around and ate with evident appetite what food was offered him."

"Nausea and vomiting were not observed and very rarely a slight stupor. The experiments did not appear to cause pain, the animals made no attempt to evade the operators, and showed no dread of later experiments."

"When, after producing the electrical sleep he continued to increase the difference of potential in the circuit he caused first an arrest of the respiratory movements, later, arrest of the heart action."

"To produce respiratory inhibition in the rabbit it was necessary to use a voltage apparently higher than that required to produce sleep; for example, he had to employ 10 volts instead of 6 which would have been sufficient to produce insensibility and loss of motion."

"It would appear that with a well regulated current the animal may be kept in the condition of sleep for hours together, and with very considerable safety. In fact, the experiments may be repeated at intervals provided the animal is allowed time to rest a few minutes during the interval between the experiments."

"In seventy-four experiments there were seven deaths, the death in each instance being due to pushing the current beyond the voltage required to produce sleep, and increasing it until it caused respiratory and cardiac failure."

"Professor Leduc concludes that there is a marked rise in the intra-carotidian blood pressure which lasts during the whole time of the electrical sleep; the temperature is rather below normal, the pupils are contracted, and the state of the reflexes depends upon the position of the anode; if this be placed on the thorax or abdomen the current does not pass through the spinal cord which is, therefore, not inhibited in its lower part, and the reflexes which are abolished in the face and upper extremities are increased in the lower extremities; if the electrode is placed on the lower part of the spine the whole cord is influenced by the current and is inhibited, and the reflexes in the lower extremities become abolished."

Professor Leduc describes his sensations under the influence of the current in the following terms:—"The sensation produced by the irritation of the superficial nerves, although disagreeable, is easily borne; after a while it quiets down just as the sensations produced by the continuous current, and after passing through a maximum of intensity, diminishes; in spite of the increase in electromotive force. The face is red, feeble contractions of the muscles of the face, neck, and forearms are produced, then I felt tingling in my fingers and hands; this tingling sensation extended to the toes and feet; the inhibition affects first the centres as speech, then the motor centres become completely inhibited, the subject is unable to react against even the most painful irritations, and he cannot communicate with the operators.

"The limbs, without being completely relaxed, presented no stiffness. The subject complains and sighs, but this is not due to any pain experienced, but seems to be caused by the stimulation of the laryngeal muscles. In the experiments on myself the pulse was not altered at all, but the respiration seemed slightly embarrassed.

"When the maximum current had been reached I still heard as in a dream what was being said around me; I was fully conscious of my impotency to move or to communicate with my colleagues; I felt the contacts, the prickings on the forearm, but the sensations were greatly benumbed. The most painful impression is to follow the dissociation and gradual disappearance of the faculties; the impression is identical with that of nightmare where in the presence of an imminent danger one can neither cry nor move. However, I could think sufficiently to profoundly regret that my colleagues did not push the current further and complete the inhibition. After our first experience we began anew, this time intending to go further; but this time again my colleagues, thinking the inhibition complete, stopped before causing complete inhibition of consciousness and sensation.

"The electro-motive force used was 35 volts, the intensity in the interrupted circuit was 4 ma. During the two consecutive séances I remained each time twenty minutes under the influence of the current.

"When the current is opened the awakening is immediate; I felt no subsequent effect, unless it be a sensation of well-being and of physical vigor, and immediately after the experiment I proceeded to a meeting which I was to address."

G. E. A.

OBSTETRICS.

UNDER THE CHARGE OF DRs. CAMERON, EVANS, AND LITTLE.

SINCLAIR SIR, WM. "Cæsarean section successfully performed for the fourth time on the same woman, with remarks on the production of utero-parietal adhesions." *Journal of Obs. and Gyn. of Brit. Emp.*, Nov., 1907.

The patient was a IV-para, aged 34 years whose obsteric history has been reported. She was extremely deformed; there being ankylosis of the left hip-joint with flexion of the left thigh upwards and inwards so that the knee was pressed upon the abdomen. The lordosis was extreme. She was of small size, and her head gave evidence of rickets. She had lost one eye and her teeth were bad.

Labour had set in the previous night, the child was living, with the head above the brim of the pelvis. Abdominal incision was made along the center of the old cicatrix, and as the dissection proceeded it was impossible to distinguish where the parietal structures ended and the uterine structures began. This permitted the whole operation to be completed without any apparent opening of the peritoneum. The wound in the uterus was closed with two series of silk-sutures and with a few silk-worm-gut sutures which brought the skin together in the external wound. The wound was dressed in lint soaked in carbolic acid and glycerine.

The convalescence was without incident. The child was a female weighing $8\frac{1}{2}$ pounds, and 18 inches in length.

The three previous Cæserean operations on the same patient are then recorded. The true conjugate was estimated at two inches.

The author reviews the various cases of repeated Cæserean Section and states that accumulating experience points to the conclusion that the patient is safest when during the second or third operation the adhesions are carefully preserved from interference.

He then proceeds to discuss the question of the production of sterility, the best time for operating in relation to the onset of labour, and the formation of adhesions, and he admits with regret that some difference of practice still exists regarding the site of incision into the uterus.

The author argues strongly against sterilizing the patient and agrees with Wallace that "all Cæserean sections should be performed with the view to ulterior pregnancy."

With regard to the time of operating, as a rule, there is no choice as most patients come under observation in labour. The objections to the

operation before the onset of labour that it predisposes to hæmorrhage from improper contraction, and that without the dilatation of the os, drainage would be interfered with, are set aside as being absolutely groundless. The impression is that those operated on before the onset of labour have the smoothest convalescence.

In the discussion of the treatment of adhesions which result from the fortuitous contact of two internal wounds or of omentum or intestine with the uterine or parietal wound, he states that these adhesions are always a source of embarrassment to the operator, and of increased danger to the patient. He thinks that many of the fatal cases recorded of repeated Cæsarean operation resulted from interference with adhesions which it would have been better to let alone. A careful review of many cases in which these adhesions have been separated and of the results obtained then follows. There is no doubt that their separation increases the duration of the operation, may cause serious danger from hæmorrhage and predisposes to injury of the intestines and the production of atony of the uterus from prolonged handling.

Without advancing any strong argument, Sir Wm. Sinclair states that in his opinion "The *Fundalschnitt nach Fritsch* should pass into desuetude or if practised at all it should be only as an exception under certain conditions." He admits that it is just possible that experience may prove that a transverse incision at the isthmus may be in exceptional cases the best, such cases probably being those which are at present so often considered spoiled for Cæsarean Section owing to mistaken, prolonged, and futile efforts to deliver the patient with forceps or otherwise. He states that "It is with a feeling of shame and indignation that I have sometimes to listen to the justification of the monstrous practice of craniotomy on the living child on this ground alone."

Though the low transverse incision is now usually practiced in Cæsarean Section in infected cases on the ground that it is practically extra-peritoneal, he is confident that his modification of the operation as described in this article would be fully as safe as the transverse incision, would be much easier of execution, and would leave the patient in a safer condition for a future operation.

After discussing the intentional production of utero-parietal adhesions, first introduced by Wallace and then by Burton, he describes in detail the technique to secure extensive and strong adhesions in the right place.

The intentional production of utero-parietal adhesions the author terms *hysteropexis hypogastrica*, and recommends the following procedure.

1. Usual external incision: eventration and wrapping up of uterus; strong temporary suture of abdominal parietes above the sponge, to prevent dislocation of bowels during operation.

2. Sufficient incision of uterus in middle line carried somewhat lower down than was usual when we feared to open cellular tissue. Extraction of foetus, placenta, etc.

3. Application of elastic ligature, not drawn too tight, but sufficient to prevent hæmorrhage and to render manipulations by assistant unnecessary.

4. Rapid and complete suture of uterine wound with silk only; deep sutures taking large hold and tied tight; superficial sutures numerous.

5. Removal of elastic band and slight compression manipulation of uterus under suitable sterilized hot wet cloth. With return of blood supply there was the usual change of colour of the uterus to red followed by sufficiently firm contraction. Uterus now put back into its normal position and obvious supplementary manipulations carried out.

The details of the proceeding suggested to secure extensive uterine adhesion to the anterior abdominal wall termed:—

Hysteropexia hypogastrica:—

(1) Fine silk sutures one on each side, are introduced low down in the vesico-uterine fold well beyond the bladder laterally so as to close the fold and prevent intrusion of intestine at some future time."

"(2) The parietal peritoneum about the level of the lower end of the abdominal wound is then drawn out a little. A fine silk suture is then passed through the peritoneum from without and made to take hold of a layer of the uterus well out from the margin of the uterine wound; it is then passed back through the peritoneum and tied. The knot is consequently extraperitoneal."

"(3) This method of suturing is continued symmetrically on both sides until the uppermost sero-serous suture was slightly above the level of the lower margin of the corpus uteri."

(4) "A stronger silk thread is now passed through the fascia on the left side of the wound, taking a good hold of it, then continued through the peritoneum and across through a considerable not very superficial portion of the uterus. The suture is then brought out through peritoneum and fascia, and so is ready to be tied as a buried suture."

7. "The final details common to all Cæsarean sections in closing the abdominal wound by four series of sutures."

8. "Thorough swabbing of the os uteri and vagina with hot, strong, corrosive sublimate solution, and application of wet antiseptic pad to vulva."

Thus is secured, (1) a wide area to the abdominal parietes by sero-serous sutures; (2) Firm support of the uterus by transverse sutures so as to prevent displacement involution. The author also claims that this procedure excludes the intestine and omentum from the field of future operation, secures the prevention of obstruction of the bowel by adhesions, and does not lead to any interference with the bladder function.

Thus in future labours should the sac of waters be ruptured, or frequent examinations have been made, or attempts at delivery have occurred, previous to coming under observation for operation, the cutting off of the peritoneal cavity by these adhesions enables delivery by Cæsarean section to be safely undertaken.

He argues that from his experience of 30 patients cured of sterility by the attachment of the fundus uteri to the anterior abdominal wall, who have gone through pregnancy and parturition without an abdominal symptom, enables him to regard objecters with indifference.

He concludes his interesting paper as follows:—"That some such method of operating must take the place of sterilization and hysterectomy, and other barbarities, I have a firm conviction. They must disappear with symphysiotomy, craniotomy of the living child, and the use of the clamp in gynæcological operations." D.J.E.

GYNÆCOLOGY.

UNDER THE CHARGE OF DRs. GARDNER, CHIPMAN, AND LOCKHART.

SARCOMA OF VULVA.

BLAIR, BELL. "Sarcoma of the Vulva, including the account of a case of Spindle-celled Sarcoma of the Labium Minus." *Journal of Obstetrics and Gynæcology* of the British Empire, October, 1907.

Dr. Blair Bell gives an exhaustive review of all cases of pure sarcoma of the vulva reported up to date with a photograph of the author's patient with the disease in situ, together with good microphotography of the diseased tissue.

The list includes 21 cases, of which the age is given in 18, showing that the age incidence is the same in vulvar sarcoma as it is in carcinoma of the same parts, viz.: 30-50 years. The usual site is the labia majora and the disease is of the myxomatous or mixed-celled variety in the majority of the cases. The prognosis is doubtful, but is probably the same as when sarcoma attacks the surface in other parts of the body.

JELLETT, HENRY. "After-history of a case of Primary Sarcoma of the Vagina." *Empire Journal*, October, 1907.

The patient was operated on in August, 1903, for primary sarcoma which extended completely around the lower third of the vagina. When the case was first published (*Empire Journal*, March, 1904), Jellett could only collect reports of 39 cases, and of these only one was of the infiltrating variety, this case being reported by Spiegelberg in 1872. The operation terminated fatally. Of the remaining 37 cases, death resulted, either from extension without operation or from recurrence, in 31 women. Five cases were observed for from 2½-11 years and one for 10 months without showing signs of recurrence. Jellett's own patient is still alive and well.

SUPPURATION OF THE OVARY.

OLIVER, JAS. "A study of suppuration of the ovary, with illustrative cases." *Empire Journal*, November, 1907.

The author first gives many details regarding the ovary and shows that, owing to all of the blood-vessels entering the ovary through a pedicle, no accessory supply is possible. Therefore, interference with this source of supply is readily effected and thus devitalisation with pus formation is favoured.

Ovarian abscess may be "pure," where it is not preceded by any necrotic change, or "mixed" where such change has taken place. A "pure" abscess is rarely larger than an orange, while the "mixed" variety may reach the size of a full term pregnant uterus. An abscess of the ovary is usually unilocular, this being an evidence of the unlikelihood of the abscess having been formed by the coalescence of several Graafian follicles.

The pus may have formed in early married life and give but little subsequent evidence of its existence, the patient seeking advice on account of her sterility. The swelling produced is globular and the great size of the "mixed" variety is due to the condition of the ovary previous to its infection, as for example where this takes place in an ovarian tumour.

When caused by the invasion of virulent micro-organisms, its course may be very acute. In 36 hours after infection, there is a rise of temperature and this is followed by a chill within a very few days, this latter denoting the liquifaction of the contents of the ovary. The temperature then rapidly falls to normal, but a more or less febrile condition may be kept up for weeks. The other symptoms are pain, tenderness, vomiting and acceleration of pulse-rate, and, while amenorrhœa

accompanies tubercular abscess, menorrhagia and metrorrhagia are often seen where the infection is by some other micro-organism than the tubercle bacillus. When rupture into the general peritoneal cavity takes place, it usually does so within the first ten days after infection.

Several illustrative cases are related in which treatment by removing the offending organ through an abdominal incision was successfully carried out.

HYSTEROPEXY.

TAYLOR, F. E. "On the formation of a 'Fundal' or 'Suspensory' ligament after hysteropexy and its dangers." *Pract.*, December, 1907.

Hysteropexy is a safe and reliable operation for posterior displacements of the uterus, but for prolapse it cannot be depended on, as it is liable to be followed by recurrence.

The operation may be divided into three groups, viz.:—(1) Indirect Fixation, where the stumps of the tubes or broad ligaments are united to the abdominal wall. (2) Lateral Direct Fixation, where the sutures are passed through the round or broad ligaments, attaching them to the anterior abdominal wall at the sides of the incision. (3) Median Direct Fixation, in which the uterus is sutured to the abdominal wall immediately beneath the incision.

The term "hysteropexy" includes ventro-fixation, in which the fascia or whole thickness of the abdominal wall is included by the suture, and ventro-suspension in which only the peritoneum is so included. In the latter, a tongue of peritoneum is drawn down, forming a "fundal" or "suspensory" ligament.

Three cases are reported where uteri, the subjects of hysteropexy, had to be removed by the author for pain, menorrhagia, etc; and Olshausen, Jacobs, Kreutzman, Wallace and others have also performed abdominal section for obstruction of the bowels caused by the band thus produced. The fixation operation undoubtedly interferes with future pregnancies while the pure suspensory operation does not do so.

INTER-DEPENDENCE OF OVARIES AND UTERUS UPON EACH OTHER.

CARMICHAEL and MARSHALL. "The co-relation of Ovarian and Uterine Functions." *British Medical Journal*, November 30th, 1907.

The authors give details of various experiments on animals, showing that:—

1. Removal of the ovaries from young animals prevents the development of the uterus and tubes, these remaining in an infantile con-

dition. The subsequent growth and nutrition of these animals appear to be unaffected.

2. Removal of the ovaries from adult animals leads to fibrous degeneration of the uterus and tubes, most marked in the mucous membrane, but does not affect the subsequent general health or nutrition.

3. Removal of the uterus from young animals does not affect the further development of the ovaries, these being capable of functioning normally in every way when adult life is reached.

4. Removal of the uterus from an adult has no effect on the function or structure of the ovaries, if their vascular connections remain intact.

GYNÆCOLOGICAL OPERATIONS UPON THE AGED.

MALCOLM, JOHN D. "Hysterectomy and appendectomy performed on a patient aged 74. Recovery." *British Medical Journal*, November 11th, 1907.

The patient was a strong, well nourished woman 74 years of age, who had suffered from gastric disturbances for several years and from increasing abdominal distension and constipation for the last twelve months. The pelvis was nearly filled by a large, rounded tumour which was fixed and was attached to the uterus. It appeared to be a soft-solid or cystic mass. Menstruation had been regular and free, but not excessive and had ceased altogether at 53.

At operation, a soft, well-nourished fibro-myoma was removed, together with the whole uterus, from the right side of which the tumour was seen to be growing. Coils of small intestine were adherent to the right side of the tumour and contained the appendix embedded amongst them. These adhesions were separated and the appendix, which contained a small black concretion near its attachment to the cæcum, was amputated. The abdominal sutures were removed on the eighth day as the wound appeared to be firmly healed. The next day, part of this was found to be broken open and, while washing the parts in order to re-insert sutures, the whole wound broke down and the intestines protruded. The edges were re-united and perfect union resulted, the sutures being removed on the 14th day and the patient made an uninterrupted recovery.

Microscopic examination of the tumour showed no trace of sarcomatous or other malignant degeneration, but "here and there a few cells had become indefinite in outline."

As a rule, fibroids shrink and tend to become calcareous after the menopause. The softness and youthful appearance of this specimen may be explained by its proximity to the cervical and uterine vessels insuring a free supply of nutriment.

UTERUS BICORNUATE.

An interesting case of this malformation is reported by Dr. G. P. Mills in the *British Medical Journal* for November 30th, 1907.

The patient was 16 years of age and had menstruated first when she was 15 years and 5 months old, her fifth period having started fifteen days before her admission to the hospital. The flow was free and of good quantity, but was accompanied by pain, the pain increasing with each period. In addition to the pain in the abdomen, the patient complained of it "shooting down the back passage." She vomited twice at the onset of her last period and the bowels had only been opened once since then. On admission, no sign of peritonitis was observed, the abdomen being soft and not distended, but an ovoid mass, the size of an hen's egg, with its long axis lying horizontally, was felt in the right iliac fossa. This mass was moveable in a vertical direction, but not laterally and it was hard and not sensitive. Per rectum a smooth, rounded mass, the size of a large cocoanut could be felt bulging down the anterior rectal wall. This was tense and elastic and connected with the mass in the abdomen. The hymen was intact, but perforated and a large mass was seen to be bulging down into the vagina. The cervix was lying to the left of the middle line and found to be connected to the tumour. At the operation, the uterus and mass were removed and upon examination, the latter was seen to be the right horn of a bicornuate uterus distended with blood which was kept from escaping into the uterus by the point of connection of the horn with the uterus being imperforate.

F. A. L. LOCKHART.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

(Continued from last issue.)

F. A. L. LOCKHART, M.D. Two points in this connexion interest me, first the cause of ectopic gestation and second the early diagnosis. A great many authorities claim that a healthy tube is more likely to lodge an ovum than a diseased one, but I was very glad to hear Dr. Chipman state exactly the contrary. In the vast majority of my own cases the patients had previously given histories of having had at least one attack of inflammation or pain in the pelvis which pointed to some pre-inflammatory disease in the tube. The points which Dr. Chipman

raised in regard to diagnosis I think were extremely well taken and I must say that I am always on the lookout for cases of ectopic gestation for if you do not diagnose a case the results are extremely serious to the patient. I think it is always better to be on guard for serious trouble and be mistaken than expose your patient to risk. Where a patient comes to me who is having irregular uterine hæmorrhages, losing a small quantity of blood each day with pain on either side I make up my mind that that patient has an ectopic gestation. I am very glad that the majority of practitioners are taking Dr. Smith's advice and sending all suspicious cases to a specialist. One patient I remember, who had suffered from menorrhagia and metrorrhagia for four or five years; I examined her very thoroughly, but could find no trace of serious inflammatory trouble in the tubes. She was subsequently seen by Dr. Berwick, who advised operation. Later she became pregnant. I saw her and on opening we found a ruptured gestation sac; the only symptoms were pain and irregular hæmorrhages and a small mass could be felt at one side.

W. W. CHIPMAN, M.D. I only wish to thank the Society for the kind way in which they have listened to the paper; and especially to thank the gentlemen who have so kindly and interestingly discussed it. As to the point of the dilating and dilated cervical canal, it is of the greatest diagnostic service in cases of early uterine abortion. In the later cases mentioned by Dr. Laphorn Smith the condition of the cervical canal is not of such great value, as we have already the presence of the extra-uterine tumour. A careful analysis of the urine was made. In the two specimens the percentage of albumin was very great and there were numerous casts, both finely and coarsely granular, but no hyalin casts, some blood—in fact all the evidence pointed to an extremely acute nephritis. The question of decortification of the kidney was broached, but I did not consider it in this case a wise procedure. So far as my own knowledge goes I am rather inclined to criticize it unfavourably, for the reason that I do not quite understand the rationale of the procedure. In the specimens that Dr. Klotz has shown there are only a few small areas of the outer zone of the cortex which are at all normal. For the greater part the whole outer zone is dead, this death due, as he has shown us, to a peripheral thrombosis in the parenchymatous vessels. This zone of necrosis illustrates very forcibly how trifling a blood-supply the cortex must receive from the kidney capsule. This being so, and the whole object of decortification being, after the congestion is relieved, to establish a greater blood-supply, I do not see how the argument follows. Surgeons, especially German surgeons, claim to have got good results

from this operation, but as I understand it, the concensus of opinion in America is rather to regard the operation as of little, if any, value.

The fourth regular meeting of the Society was held Friday evening, November 15th, 1907, Dr. Wesley Mills, President, in the chair.

PATENT DUCTUS ARTERIOSUS.

W. F. HAMILTON, M.D., presented this case a report of which appears in the number of this JOURNAL.

A. D. BLACKADER, M.D.:—Patency of the ductus arteriosus would appear to be due to increased pressure either in the pulmonary artery arising from some interference with the pulmonary circulation, or in the aorta owing to some congenital defect. I would be glad to learn from Dr. Hamilton, who has so carefully studied this very interesting case in which class he feels inclined to place it.

F. J. SHEPHERD, M.D.:—Dr. Hamilton is to be congratulated in bringing such an interesting case before the society. Dr. Munro, of Boston, has lately advocated cutting down, upon the heart and obliterating by ligature the ductus arteriosus. He has made many experiments in this connection on animals, but not yet on human beings. Congenital anomalies are rarely single and in stopping the circulation through the duct other arrests of development which might exist would no doubt have to be reckoned with.

ACCESSORY CARUNCLE.

GEO. H. MATHEWSON, M.D.:—The specimen was taken from a woman aged 21. It was a small tumour situated in the inner angle of the left eye between the margins of the eyelids. It was present from birth and had grown but little since. There was no pain or discomfort. The tumour was found to be attached to the margin of the upper lid, by a pedicle, at a point just to the nasal side of the punctum lacrymale. It was removed by cutting through the pedicle with fine scissors. Microscopically, it showed fibrous tissue and fat in abundance with many large sebaceous glands and hair follicles with some striated and some non-striated muscles.

DISCHARGE FROM VAGINA.

C. C. GURD, M.D.:—Showed a baby aged 12 days, under the care of Dr. Sophie Pouchofsky, with a bloody discharge from the vagina beginning on the third day. The child is perfectly normal; the breasts are if anything more developed than usual.

W. W. CHIPMAN, M.D.:—This case of Dr. Gurd's is extremely interesting, and is somewhat rare. It does occur occasionally, I believe,

in new-born children, and the blood comes from the mucosa, the primitive mucosa of the uterus. I think it has to do with the establishment of the systemic circulation. It is a fact, I believe, that the general blood pressure of the infant suddenly falls with the establishment of the pulmonary circulation. This pressure, however, soon rises again, and to a higher point than ever before. In other words, the general blood-pressure in extra-uterine life is considerably greater than in intra-uterine life. These facts give us, I think, the best explanation of these early vaginal hæmorrhages. The sudden fall and subsequent rise in blood pressure ruptures some of the small capillaries of the primitive uterine mucosa, and so gives rise to the hæmorrhage. It is always very difficult in these cases to ascertain the exact source of the bleeding. I have seen one such case where, after a distinct discharge of blood from the vagina, the infant died. At autopsy it was found that the rudimentary uterine mucosa was greatly congested, a number of the superficial capillaries were ruptured, and the hæmorrhage had occurred from the mucosal surface.

EXPERIMENTAL WORK UPON PERITONEAL ADHESIONS.

E. W. ARCHIBALD, M.D., and J. L. D. MASON, M.D.:—Dr. Archibald read the paper of the evening.

F. J. SHEPHERD, M.D.:—I should like to express my appreciation of this excellent paper relating to experiments extending over a series of years, and which have not been without results. If a perfect paint has not been discovered to prevent these raw surfaces adhering, Dr. Archibald has at least advanced some steps nearer that goal. What we have heard is of the greatest service to all of us and it impresses us with the excellent work of Dr. Archibald—purely scientific work, that is really the source of all true science. One thing he has emphasized, viz., the uselessness and danger of gauze drainage. Many surgeons have felt for a long time that gauze packing in acute cases was a dangerous proceeding and this danger Dr. Archibald has brought personally before us.

A. LAPTHORN SMITH, M.D.:—One question which interests me is that of the dry method of preventing adhesions. I have noticed operators dusting some powder such as aristol on raw surfaces. For myself I have never tried it for where I find a mass of adhesions which cause little or no trouble, I think it better to leave them alone; because if you tear them up they are bound to adhere again at once; while it is surprising to find how well things will go on in the intestine under what we would think were very difficult conditions. I have torn off large areas of the peritoneum from the intestine and yet the patient has lived

for many years with no trouble from constipation, etc. In some of these cases I had to use the actual cautery to stop the bleeding. I have often wondered whether the filling of the abdomen with hot salt solution, where we have considerable raw surface on the intestines, would not dilute this lymph which is poured out, and whether when diluted sufficiently it would not be absorbed instead of forming the glue which is the cause of adhesions. With regard to gauze I have never used it, always holding that it is followed by considerable irritation. With regard to the omentum seemingly acting as a policeman, I have been surprised at the way the omentum will find out trouble which is going on in the peritoneal cavity, and wall it off. I have seen it winding itself about an appendix, or getting round a tube which was becoming dangerous, and going up to the upper part of the abdomen and fastening itself there. When I have raw surfaces, such for instance as follow the tearing up of the uterus where the tubes and ovaries have been bound down over a large surface in Douglas' cul-de-sac, I put the omentum over the raw surface as well as I can and it adheres over this and the patients do very well.

W. W. CHIPMAN, M.D.:—Dr. Archibald has set us rather an ideal in the way of experimental work. It has been painstaking, thorough and scientific. What has struck me most is his wise and generous use of *control* experiments. It is these controls which make this piece of experimental work especially valuable, for the reason that the results must be in consequence valid. One point I should like to ask Dr. Archibald about is this. We know that peritoneal adhesions re-form rapidly after the abdomen is closed, contiguous, raw surfaces becoming speedily glued together. This glueing together is brought about by the lymph exudate, and occurs more rapidly where this exudate is of high specific gravity, that is, where it contains a great number of leucocytes. Where the exudate is of lower specific gravity there are fewer leucocytes, and accordingly less fibrin ferment. In consequence clotting, and the resultant adhesion of surfaces, must occur much more slowly. It is for this reason, in order to secure the dilution of this plastic lymph, to make it of lower specific gravity, that I have been accustomed to use for the purpose of preventing the formation of peritoneal adhesions, the ordinary normal salt solution. I feel that where the peritoneal cavity is left filled with this solution adhesions are less likely to reform, and this for two reasons. The salt solution as an inert body holds apart neighbouring raw surfaces, prevents them falling together; and again it dilutes the plastic lymph which is thrown out and so makes agglutination and clotting to occur more slowly and imperfectly. I

should like to ask Dr. Archibald's opinion in this matter, as to whether, in the light of his experimental work, he considers the empirical use of the salt solution as justified.

WM. GARDNER, M.D.:—In adding my hearty word of appreciation I would like to ask Dr. Archibald if he considered the use of oil in his experiments. Several years ago in watching Martin, then of Berlin, doing a gynecological operation to loosen adhesions, he was in the habit at the conclusion of the operation of passing in a sponge soaked with oil and I should like to know if this had been considered.

C. K. P. HENRY, M.D.:—In connection with Dr. Archibald's control test in animals, the question of following out laparotomies in the human with the possibility of determining a final result is not very often observed. Occasionally one sees a case where an operation had been done at one time for some purulent trouble and later, on opening the abdomen, no adhesions were present. Consequently it seems to me that the use of gelatin as described, at least in the human, will be somewhat problematical for some time to come; the results obtained in animals can hardly be those obtained in the human subject. In a case of appendicitis I had in January, 1903, there was well marked peritonitis of a couple of days standing and at operation a large quantity of pus was removed from both flanks. The peritoneal cavity was irrigated and several drainage tubes were used with large gauze drains. The case recovered completely. In the spring of 1905 the abdomen was again opened. At this time the muscles had become widely separated along the course of the drainage tube. No bowel was found immediately adherent to the scar though the abdomen was not explored to see whether there were adhesions elsewhere. In 1907 the patient again had the abdomen opened in the median line for the extirpation of a large abscess cavity in connection with the right tube and ovary; there had been two attacks of peritonitis with abscess formation in the pouch of Douglas with drainage through the posterior vaginal fornix. At this operation the abdomen was carefully gone over to see if there were any adhesions present from the primary peritonitis. The scar was normal without any adhesion of bowel, the visceral and the parietal peritoneum were found totally unattached at any point. Consequently it can be seen that in many of the cases even where this solution can be used it would be still unjustifiable to conclude that the solution used had been the means of preventing readhesion should one have a chance to reopen the abdomen later find the peritoneum unattached.

G. H. MATHEWSON, M.D.:—As regards the effect of saline in preventing adhesions, ophthalmology has taught us that it has no or very

little effect in this connection. Where the two conjunctival surfaces are bathed with saline yet adhesions are sure to form between abraded surfaces unless we keep passing a probe covered with vaselin across the two opposing surfaces. This of course in the presence of infection, for it is impossible to keep the conjunctival sac aseptic.

WESLEY MILLS, M.D.:—I desire as an experimenter on animals to express my admiration of the patience and perseverance with which Dr. Archibald has carried out this and to rejoice in the enlightenment which it has been successful in producing; and I hope that his paper may lead to others of a similar kind. If such contributions were more frequent a new era could dawn in the history of this Society.

F. W. ENGLAND, M.D.:—Dr. Archibald candidly states that up to the present time he has not been able to find a substance of any material benefit in preventing peritoneal adhesions in the presence of infection. And this is notwithstanding his thorough and most excellent experimental work. Dr. Archibald has given us a definite means of preventing peritoneal adhesions after abdominal operations in aseptic conditions and it is to be hoped that he will continue his good work and at a later date be able to give us a method by means of which we can accomplish much even in dealing with desperate cases of septic peritonitis.

E. W. ARCHIBALD, M.D.:—With regard to gauze, I came to the very settled conviction that its use in the general peritoneal cavity, that is apart from abscess, was quite unjustified, unless one wanted to provoke adhesions; certainly there was nothing more certain to cause them; and I think it is with justice that surgeons now-a-days have come to abandon its use very largely. As to the dry method, the rubbing in of a powder, I used this (iodomol), following Robert Morris, in six cases; adhesions recurred in three, in two the result was indecisive; and in one there was partial success. This I thought negated the claims of Morris in favour of Aristol powder.

As to the leaving of adhesions alone, that is, of course, what one will do, if they are not causing trouble. With regard to the cautery, it is true that, when the actual cautery is used adhesions are very apt not to follow, because where you have necrosis of tissue, union by primary intention is prevented. As to salt solution this was the original substance used to prevent adhesions. It was employed extensively in Germany; but both experimental and clinical observation accumulated to show that it was insufficient, absorption being too rapid. The results proved almost uniformly disappointing. It is true that the early hours are above all important; it is the clotting which it is necessary to prevent. Once surfaces are adherent by the clotting of

fibrin, this remain adherent by the interlacing hold of the mass of fibrin filaments, even after the fluid exudate is reabsorbed.

In reply to Dr. Shaw, what I said in regard to the gelatin was that mucilage, not gum arabic, was a vegetable gelatin. Dr. Gardner referred to the use of oil. This substance has been used by several experimenters in the past, with the result that it was found to be too irritating. Olive oil was used in animals; but as to its employment in the human I have no knowledge. These experiments were carried out with the view of preventing the re-adhesion of surface which had been already adherent, not to prevent adhesions which had not already formed; that is the gelatin is to be used at secondary operations only, and not to prevent adhesions which are only likely to form, say from a peritonitis. I admit that the value of the gelatin would be problematical if it were used at a first operation; and indeed, I stated very explicitly that, in the presence of active infection, it was entirely useless to employ the gelatin, or, as I believe, any other kind of preventive. Under such circumstances, any application would, I think, be more likely to hinder Nature in her struggle with the infection than to help her.

The fifth regular meeting of the Society was held Friday evening, December 6th, 1907, Dr. Wesley Mills, President, in the Chair.

The following living cases were presented before the Society:

N. VINER, M.D.:—"Blue Baby," 17 years old.

G. E. ARMSTRONG, M.D.:—Pancreatic cyst.

A. E. GARROW, M.D.:—I would like to know if there was any history of trauma in this case.

J. M. ELDER, M.D.:—The explanation in regard to the jaundice in this case may be a correct one. Mayo Robson says that jaundice is a common symptom in the course of pancreatic cyst, and his explanation of it is that you get practically an obstructive jaundice from pressure upon the canal of Wirsung, where the two ducts join.

H. A. LAFLEUR, M.D.:—This man was under my observation for quite a while and was also seen by some of my colleagues. He seemed rather a young man to have a carcinoma of the stomach and the local conditions did not quite correspond to what one generally finds and particularly the fact that it had an elastic feel. Where we were led astray was in laying too much stress upon the stomach contents. It was really upon the half dozen examinations we made, always with the same results and in view of the rapid emaciation that we came to the conclusion by exclusion that it was probably a carcinoma of the stomach. I regret to say that having this opinion we did not make any examina-

tion of the stools for fat. I suppose the explanation of the vomiting was that pressure on the stomach caused stasis as well as the presence of lactic acid.

F. R. ENGLAND, M.D.:—I would like to ask if Dr. Armstrong associates the fact of jaundice a year ago with the diagnosis.

TORTICOLLIS SECONDARY TO HYPERTROPIA.

W. GORDON M. BYERS, M.D.:—I thought perhaps the members of this Society would be interested in seeing this very marked example of the condition to which Landolt has given the name "Ocular Torticollis." The primary lesion is a vertical separation of the eyes of from 40° to 45° ; and the tilting of the head to the side is to overcome the diplopia which must necessarily arise when the erect position is maintained. Doctor Turner has gone over the case very carefully, and assures me that there is no other possible cause for the torticollis, and no fixed changes in the spine. Other cases of this kind have been noted secondary to astigmatism, and have been cured by correcting lenses. I propose advancing the superior rectus of the right eye, and later tenotomizing the superior rectus of the opposite side if necessary.

W. G. TURNER, M.D.:—The muscle action is quite symmetrical on both sides; the X-Rays showed a little asymmetry in one transverse process, but the condition is entirely functional because the correction is so readily obtained without spasm of any muscle involved.

J. M. ELDER, M.D.:—I would like to ask if there is any actual shortening of the sterno-mastoid muscle.

F. M. FRY, M.D.:—I would like to ask Dr. Byers at what age the muscular error appeared; has it always been that way or was it brought on by close vision at an early age?

RENAL TUBERCULOSIS.

R. P. CAMPBELL, M.D., read the paper of the evening.

WESLEY MILLS, M.D.:—I desire to congratulate Dr. Campbell, one of our youngest members, on such thorough work so admirably presented; and I could have wished that all the oldest members of the Society had been here that they might rejoice together at the progress of the profession. We are passing rapidly from foggiess and uncertainty to positive scientific accuracy, and the manner in which knowledge and skill has been combined in this case is certainly most encouraging for the future.

J. M. ELDER, M.D.:—I should like to add my word of appreciation of this paper, and also to express my personal gratitude to Dr. Campbell for the great assistance he has given us in the solution of the problems connected with renal tuberculosis. I think we all know how

difficult it is to come to a conclusion just when one should attempt nephrectomy and when one should not. Nephrectomy should never be done on a bad kidney until we know the other is competent to do the work. I have removed, with fatal results, one kidney, where the other was almost as bad. If catheterization shows both kidneys diseased we are hardly justified in removing what we deem to be the worse of the two. With regard to the treatment of renal tuberculosis, Dr. Armstrong has raised a point which has been much discussed, and it does seem rather radical treatment to remove a whole kidney for what turns out to be a very small lesion. It has been pointed out that when a patient has renal tuberculosis he will very shortly get tuberculosis of the bladder—a termination one hardly would wish for and for which so little can be done. We must be prepared to take rather greater risks in the kidney in order to get rid of a tubercular cystitis. On the other hand, the English surgeons are conservative, and Henry Morris advocates splitting the kidney, taking care to control all hæmorrhage, and doing a partial nephrectomy, removing only the small piece of diseased kidney tissue. This might be done in more of our cases instead of a complete nephrectomy, and with perhaps better results and certainly less risk.

W. GARDNER, M.D.:—I wish to add my word of admiration for this splendid piece of work with reference to the question of operation for tuberculosis of the kidney or other organ or viscus and the joints. I should like to ask if it has been the experience of any members of the Society that such intervention has been speedily followed by generalized tuberculosis or acute tuberculosis in some other, perhaps distant organ as for instance the brain. I have seen somewhere the opinion expressed that such is sometimes the case. Some years ago, I opened a large acute intraperitoneal tuberculous collection of pus. At the time of operation the patient, a girl of 16, had high temperature. A few days after operation she developed tubercular meningitis which ran a typical course to death in three weeks.

M. LAUTERMAN:—I note by the charts that there is only one instance in which the freezing point of the urine was recorded and I would like to ask Dr. Campbell's opinion of this method and whether he has used it at all regularly and if he has any opinion as to whether the method has proved all that has been claimed for it.

(To be continued.)