MEDICAL SCIENCE

ISSUED MONTHLY — VIDEO MELIORA PROBOQUE — TORONTO, NOV. 1, 1887

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MEDICAL SCIENCE

VIDEO MELIORA PROBOQUE

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INTRODUCTION.

HOW different the distracting fears, the apprehensions of failure, the scarce dared expectations of success of the *dèbutante*, from the calm, self-confident attitude of a *maestro*, in appearing before a critical public who pay for their pleasure and expect their desires to be gratified! Somewhat of the fears of the *dèbutante* afflicts us as with a fervent desire to attain to our ideal, to accomplish a worthy task, we launch a new enterprise and invite the patient attention and generous forbearance of a cultivated medical public, while we state succinctly several reasons why MEDICAL SCIENCE has been evolved and begun to exist. Mingled with our fears we indulge in the hope that something of the experience and finished grace of the master may gradually become ours, associated as well with his success as a suitor for public recognition.

Meehan says in *Variations in Nature:* "Nature knows primarily only the individual. This individual is made to reproduce itself after a short term of life, but with some general resemblance; yet each individual varies from its parent, some in one direction, some in another, the object of this variation being to reach some harmonious result far away in the future." MEDICAL SCIENCE is but a new individual varying from its parents, but, we trust, bearing a close family resemblance. Mr. Darwin has said that while "variability is not an inherent and necessary contingent" of existence, yet variation is due to the direct action of the conditions of life: to use and disuse, etc. Thus we are taught that the individual inevitably varies in some degree from the parent since the conditions of life never remain the same; and, if MEDICAL SCIENCE proposes to vary somewhat the routine practiced by other Canadian medical journals, it may fairly be said that the variation is simply the logical outcome of the laws of growth and evolution. In the past, medical journals in Ontario have been the exponents of some *proprietary* School of Medicine, with the evils, as well as the advantages, incident to such a connection. Contemporary with the appearance of MEDICAL SCIENCE, we can say that, for the first time in the history of Canadian medical literature, a medical faculty, on a far wider basis than was possible in the past, has been established. Though in some respects "a beam in darkness,' our fervent prayer is "let it grow"! Medical educational facilities, due to governmental action which deprived the Provincial University, in 1853, of her Medical Faculty, have hitherto, while doing the most possible under the circumstances, been of necessity largely limited to the narrow course which a purely curative system, or *ars medendi*, demands. Even though "Science moves, but slowly, slowly," still, as Galileo said of the earth, "*It does move.*" and Medicine, as the cynosure of all the sciences, advances too. The brilliant Semmola has recently said, "To-day the duty of the physician who wishes to be the real pioneer of scientific medicine is that of applying all the great truths of the past to the bright laws of

physics, of chemistry, of physiology, and of pathological anatomy"; and to the advancement of this end we consecrate the labours of this new journal. But advanced science has in large measure failed, where all our philosophers have failed, in the field of reconstruction; and in the domain of Medicine her greatest triumphs have been, and must necessarily continue to be, in preventing disease. Remembering that the Royal College of Physicians has enumerated one thousand one hundred and forty-six variations from health in the human family, there can be no surprise that one of the most advanced teachers, recently deceased, of the *art of healing*, should have said, that the science of medicine of the future must be increasingly preventive. Noble as is the science which relieves pain, greater is that which prevents it: To the field of preventive medicine, therefore, as an integral part of the teaching and practice of Medicine, we hope to devote our best energies. In fine, we bespeak for our new enterprise the kindly consideration, and hearty endorsation and support of those wishing to see developed, with whatever energy and ability the journal may be capable of, the thought, which a sweet singer finds in musing over the camerated coil of the nautilus:

"Build thee more stately mansions, O my soul,
As the swift seasons roll;
Leave thy low vaulted past!
Let each new temple, nobler than the last,
Shut thee from heaven with a dome more vast,
Till thou at length art free,
Leaving thy outgrown shell by Life's unresting sea!"

Regarding the public policy of MEDICAL SCIENCE it seems almost unnecessary to add, after what has already been said, that all measures of governmental policy, having for their aim the extension of the facilities for experimental study, whether in medicine proper, veterinary science or bacteriological work as affecting plants and agriculture will have the journal's constant attention and support, since quoting Virchow, "Science is unproductive when it has not a national character"; while every movement of expediency tending to disintegration and sectionalism may expect its unqualified disapproval. As regards its attitude towards existing Medical Schools, we trust each and all of them will find in "MEDICAL SCIENCE" active support and recognition of all efforts put forth for the development of true scientific work, and uncompromising hostility to any disposition on their part to become mere "mills." For the Medical Council we have but kindly words and encouragement, so long as the recent manifestations of endeavours to improve the status of the profession and to stimulate the teaching of practical work by increasing clinical and laboratory examinations are evident; but should the "old leaven" of *laisser faire aller* again germinate or develop we may be expected to point out to the electorate in what particulars members fail of their duty. The Council, as voicing the opinion of all parts of the Province, are considered to represent the opinions of the various constituencies, and become a benefit to the profession in proportion to the breadth of opinion they as legislators may hold. To the Local Boards of Health and their Medical and Sanitary officers, who by law have powers and duties laid upon them, often as disagreeable as they are extended and responsible, it is not too much to promise that it shall be our constant pleasure and duty to supply, in the most available and practical form, the most recent information on the varied matters which come under their control: and to the Medical health officers we would say that our appreciation of their position and of the demands upon their time and resources insures for them the championship of their rights before an often unappreciative or ungrateful public, until their status from the standpoint of adequate remuneration shall have in some degree been recognized.

From all for the fulfilment of what we deem to be our mission we shall expect that small but necessary financial support, which shall obviate the appropriate epitaph:

"Full short his journey was, no dust
Of earth unto his sandals clave;
The weary weight that old men must
He bore not to the grave."

ORIGINAL ARTICLES.

HÆMATOZOA OF MALARIA.

BY WILLIAM OSLER, M.D., F.R.C.P.

Extended Abstract of Monograph kindly given by the Author.

[No apology need be made to our readers for the publication at this time of these abstracts, since their importance and interest are permanent, and may be made of much value to observers in various parts of the Province who have not had access to the original article. – ED.

OUR knowledge of the blood changes I am about to describe, dates from the researches of Laveran, in Algiers, which were communicated to the Paris Academy of Medicine in 1881 and 1882, and which were finally embodied in a large work on the malarial fevers, published in 1884. He found, as characteristic elements in the blood of persons attacked with malaria, (1) crescentic pigmented bodies; (2) pigmented bodies in the interior of the red corpuscles, which underwent changes in form, described as amœboid; and (3) a pigmented flagellate organism. These forms were looked upon as phases in the development of an infusorial organism which he regarded as the germ of the disease.

1. *The Forms which Exist within the Red Corpuscle.—(a)* The most common alteration in the blood of malarial patients is presented by a pigmented structure inside the red corpuscle. The attention of the observer will most likely be first attracted by the presence of a few dark grains in the stroma, and a careful study of a suitable specimen will soon lead to the conviction that these are not scattered loosely, but are enclosed in a fine granular or hyaline body in the interior of the corpuscle. The red discs in which they occur are usually larger, look flat, and are very often paler than normal; they may, indeed, exist as colourless shells. The number of corpuscles so affected varies extremely in different cases. In some instances they are readily found after a search of a moment or two, but, in other cases, a prolonged examination may be necessary. Only one is usually present in each corpuscle, but two or three, or even four, may occupy the stroma. They vary greatly in size, the smaller ones not occupying a fourth of the corpuscle, while the larger ones may almost fill it. A delicate contour line can usually be seen separating the body from the stroma; at times this is very distinct, particularly if the illumination is very bright. The substance appears hyaline, or very finely granular, and the pigment grains are scattered irregularly in it. They may be very numerous, and give a dark aspect to the body, or they may be scanty. They frequently present rapid Brownian movements. Occasionally a vacuole may be seen in the interior of the body. In several instances the bodies appeared to be enclosed in a clear space—vacuole—in the stroma. When first seen they are more or less spherical, but, as already stated, the outline may be indistinct. The pigment granules may be seen to alter their position in relation to each other. If the margin of the body is carefully observed, slow changes can be seen, which gradually bring about alterations in shape. These movements which appear to be amœboid in character, can often be traced with great ease. I have not seen any evidence of migration from the corpuscle.

(b) In seven cases peculiar hyaline structures existed in the interior of the red corpuscles, which differ from the bodies just described, in the absence of pigment and in the much greater activity of the changes. These bodies are devoid of structure, and the corpuscles in which they are present are not so pale as those with the pigmented forms. Marchiafava and Celli, who have given an excellent plate of these bodies, regard them as the initial forms of the pigmented bodies. One does occasionally see appearances indicative of commencing pigmentation, but they have not, as a rule, the solid aspect of the pigmented bodies. In three cases I have seen the following remarkable changes. The hyaline body, while actively changing shape, suddenly burst from the stroma, and disappeared, or formed only a few granules. Thus, in a red corpuscle, there were, at 3.40 P.M., two hyaline, irregular-shaped bodies, which were changing rapidly in outline. The alterations were so marked that the physicians present at the time had no difficulty in seeing them. The stroma of the corpuscle was of full colour. At 3.50 P.M., as I was carefully watching the forms, the corpuscle suddenly ruptured, and gave exit to two distinct masses, which quickly broke up into ten or twelve

spherical bodies. No change took place in these after twelve hours, except that they became pale and distinct. The stroma of the corpuscle became quite colourless. On two other occasions a similar phenomenon was witnessed, but in one no trace could be seen of the extruded material. This is evidently a physical change, and I think these very pale hyaline bodies must be carefully distinguished from the pigmented forms, though possibly associated with their early development.

(c) In seven cases there were vacuoles in the red corpusles containing solid-looking bodies of various sizes and shapes. Certain of these structures resembled micrococci very closely, and stained deeply in aniline dyes; but others, often in the same corpuscle, were larger, more irregular, and altogether different in appearance.

2. *The Free Forms.*—*(a)* Pigmented crescents. These bodies, which were found in eighteen cases, present remarkable features in appearance and structure. The form was usually that of a beautiful cresent, with rounded or gently tapering ends; but the degree of curvature was variable, and many forms were almost straight. The length is about double that of the width of a red corpuscle, sometimes more. They are not attached, and they never show any motion. Joining the ends of the crescents—or, more correctly, at a little distance from the points—a narrow line can often be seen on the concave margin. The body of the crescent appears made up of a structureless, homogeneous material, in the centre of which is a prominent collection of pigment granules.

Although the most careful examination fails to detect any movement in the hyaline substance of the crescent, yet the existence of such may be inferred from the very positive movement which the pigent granules undergo.

(b) The Rossette Form.—In six instances there were rounded bodies, a little larger than red corpuscles with a dimly granular protoplasm, and in the centre a rossette of pigment. Some of these appeared to be enclosed in a delicate membrane, others were free. In six cases remarkable changes were seen in these forms, of the nature of segmentation.

(c) Flagellate Organisms.—Flagellate bodies were seen in seven cases, never in great numbers, usually only one or two in a slide. They are smaller than red blood-corpuscles, often not more than half the size. A specimen in one case was equal in one diameter to a red corpuscle lying near it. They are round, ovoid, or pear-shaped: the protoplasm finely granular, and in every instance contained pigment, usually central, which often displayed rapid Brownian movements. The flagella are variable in number; one, three and four were noted in different specimens. The length, as closely as could be estimated, was two or three times that of the body. They are exceedingly delicate, gently tapering, and, except in one instance, I could not determine the existence of a small terminal knob, figured by Laveran. The movement is exceedingly active, and the lashing of the long filaments may be sufficiently strong to drive away the corpuscles in the vicinity. The undulatory movement caused by the play of the filament over the surface of a group of corpuscles may attract the attention of the observer before he sees the cilia. The motion does not persist long; in none of the specimens which I examined, for more than half an hour. In one instance, the flagella disappeared in the short interval between two observations, but I could not determine what became of them. I have not seen the free-swimming cilia described by Laveran, but Dr. Councilman tells me that he has confirmed this observation.

(d) Small, round, pigmented bodies, from one-fourth to one-half the size of a red corpuscle, were not uncommon in some cases.

The red corpuscles showed no other notable alteration save that already described. The pigmented organism evidently destroys the vitality, and consumes the hæmoglobin, for the affected cells become pale, often spherical, and, finally, are reduced to the condition of mere shells; except in cases of pronounced anæmia, the variations of the corpuscles in size and outline were not great. The colourless corpuscles were in some cases increased in number, and in very many instances contained dark granules.

(To be continued.)

CASE OF NUMEROUS FRACTURES.

BY A. B. ATHERTON, M.D., F.R.C.P. AND S., EDIN., TORONTO.

D. B., male, *æt.* 28, has always been a strong, hardy, able person. While acting as conductor of a construction train on the Riviére du Loup railway, he was crossing for the first time a

newly-built bridge over the St. John river at Andover, N. B., when the bridge gave way under the weight of an engine and a car-load of iron rails, and he, with a few others, was precipitated into the stream twenty-five feet below. There had been some doubt expressed as to the solidity of the structure, and the conductor stood ready to disconnect the car from the engine on the first indication of any yielding from the weight of the latter. While attempting to draw the iron pin so as to accomplish this object, the whole train went down together. The accident occurred on Oct. 12th, 1875, and after his rescue from the water he was immediately attended by Dr. Beveridge, of Andover, who also called to his aid Dr. Decker, of Fort Fairfield, Maine. On examination, they found a simple fracture of right thigh, two fractures of the lower jaw, simple fracture of both radii, and compound fractures of both patellae. The fracture of thigh was put up with coaptation splints and Liston's long outside one. The jaw was treated by the ordinary splint and bandage. The usual anterior splints were used for the Colles' fractures. Adhesive plaster was applied in strips to the wounds over patellae.

I was summoned to see the patient, in consultation, and arrived from Fredericton on the day following the accident. I examined all the fractures except that of the thigh: but as the position and length of the limb were good I did not meddle with it. There was a longitudinal wound of the chin about one and a half inches long, with a fracture of the jaw at this point, while distinct motion and crepitus could be got on the left side at the neck of the bone. The fractures of the patellae were stellate in form, and the skin over them lacerated. There was little displacement of the fragments. The patient complained a good deal of pain and distress in the chest, but no fracture of bone or injury to internal organs could be made out. I advised but little change in treatment, except the substitution of carbolised oil dressing to knees instead of the strips of adhesive plaster. Three days after this I visited patient with Dr. Beveridge a second time. He told me that he had suffered more from pain in thorax than from fractures. Nothing seriously wrong could be found there, however, and the treatment by opiates, etc., was ordered to be continued. Everything went on fairly well till about Nov. 10th, when the discharge from the right knee became more free. There was also a good deal of swelling and some redness of the skin. I visited patient for the third time at Andover on the 13th. I found him much emaciated, pulse 120, very feeble. Right knee much swollen, especially on its outer side. Pressure here caused pus to well freely up through the centre of broken patellae. As thigh and wrists were apparently about well, the splints were left off them. Considerable discharge still coming from chin, and bone not yet united there. As patient's home was near Fredericton, it was decided to remove him there. A posterior splint having been put on right leg, he was placed aboard the train on a mattress, and carried without much suffering to his home, an hundred miles distant. On the following day I made a free opening into abscess of knee and put in a drainage-tube.

Nov. 30.—Since last report patient's condition has been steadily improving. The discharge from it has almost ceased. The left knee is entirely healed. There is less motion between the fragments of broken jaw; but several sinuses, discharging pretty freely, still exist in skin over the fracture.

Dec. 14.—Has been able to flex left knee considerably of late. Right knee soundly healed. Fractured jaw firmly united, but some sinuses yet remaining over that part. May begin to flex right knee every day as well as left.

Dec. 21.—Stood on feet for the first time since accident, exactly ten weeks from date of injury.

Dec. 24.—Can flex knee nearly to a right angle; also considerable motion in right knee joint.

Feb. 28.—Patient has returned to his duties as a conductor. Has been engaged for a week in shovelling snow on blocaded train. Complains only of his wrists hurting him a little. Can use left knee as well as ever, but right one is somewhat stiff yet.

April 25.—Has perfect use of both knees now.

Remarks.—Such a rapid and satisfactory recovery from so many fractures, some of them of so serious a nature, is not common. The stellate form of the fractures of the patellae undoubtedly conduced to the close approximations of the fragments and thus ensured bony union. It is remarkable, however, that perfect use of the joints resulted, especially in the case of the right knee, where suppuration of the joint must have occurred. The unusually good physique of the man was unques-

tionably one important factor among those which led to so excellent a recovery. The stooping posture of the patient at the time when the bridge gave way accounts of course for the position of all the fractures, except that of the thigh. The wounds of the chin and knees were doubtless caused by their striking upon the iron rails in the fall I am unable personally to vouch for the fracture of the shaft of the femur; but as the two medical men who put it up affirm most positively that there was undoubted evidence of that fact, there can be no reasonable question about it. In that case the usual shortening of the limb is to be accounted for by the muscular relaxation consequent upon the shock arising from so severe an accident.

HEMIPLEGIA IN CHILDREN: A CASE WITH REMARKS

BY A MCPHEDRAN, M.D.,

Dean of Faculty and Lecturer on Practice of Medicine, Woman's Medical College, Toronto.

THE occurrence of hemiplegia in children is sufficiently rare to render all cases, from whatever cause arising, of considerable interest. The following case may serve a useful purpose in drawing the attention to a form of hemiplegia in children described by Strümpell in his text book of medicine, under the head of "Acute Encephalitis of Children." The history of the case is imperfect; the chief points in it, as far as could be ascertained, are as follows: Nettie F., aged nine, as an infant had "fainting fits," but without convulsions; has had none for some years during which she has been healthy and bright. Family history contains nothing worthy of note. About Sept. 20th, in the evening she had some feverishness with a severe convulsion. Next day she was quite conscious, feeling almost well but the right side, including face, was completely paralysed. I first saw her on Oct. 5th, and she appeared as if recovering from a mild fever, the tongue was red and thickly coated in patches with whitish fur; there was some redness of the throat also. She had been able to take her food fairly all along. Paralysis of the arm was complete and nearly so of the right side of the face and of the leg. The tongue was protruded to the right and utterance was very indistinct. Sensation was normal, muscles firm, skin warm and patellar and tendon reflex easily elicited but not excessive. The pupils were normal, bowels and bladder acted naturally. All the organs of abdomen and thorax apparently healthy: the heart-sounds distinct and without any roughness or irregularity. She has had neither rheumatism nor chorea.

Since then she has steadily improved and now she is able to walk, though with difficulty, and move the arm about. The face has completely recovered as have also the organs of speech. The tongue is clear. The patellar reflex is exaggerated considerably.

It is impossible to be quite certain as to the cerebral lesion in this case. It may be that there was intracranial hemorrhage, meningeal or cerebral; but from the age of the girl this is improbable. A more probable cause is embolism, but there is nothing to indicate a possible origin for an embolus; the heart is apparently healthy as are all the other organs. Of course it is quite possible for an embolus to escape into the blood without there being any signs to indicate its origin.

A third cause—acute encephalitis is assigned by Strümpell for cases of hemiplegia very similar to this one though usually accompanied with more severe constitutional symptoms which are often indistinguishable from those of infantile spinal paralysis. It usually occurs between the ages of one and four years. The attack is nearly always acute. A previously healthy child suddenly becomes feverish with nausea and vomiting, or at once followed by grave cerebral symptoms, convulsions being particularly frequent. This condition may last from one day to two or three weeks after which the symptoms abate and the child is found to be paralysed on one side. Improvement soon sets in, the cranial nerves usually recovering completely, those of the extremities seldom doing so, the arm being worse than the leg. There is arrest of development, impairment of motion, usually increased reflexes and contractures. The muscles are somewhat atrophied but do not give the reaction of degeneration. Sensation continues normal. Motor symptoms of irritation, usually of a chronic character, often develope later. Epilepsy is not infrequent and the mental faculties are often more or less defective. The course of the disease bears a striking resemblance to acute spinal paralysis of children but with certain well-defined differences, viz.: the hemiplegic character, absence of

marked atrophy, exaggerated reflexes and normal electrical reaction.

The pathological conditions in acute cases have not been observed yet; in chronic cases the cerebrum presents marked localized atrophy with cicatricial contractions. If the disease be near the surface, as it usually is, there is depression with thickening of the pia mater. The pyramidal tracts and lateral columns of the cord present secondary degeneration. Strümpell believes the diseased process to be limited to the motor area of the cortex cerebri.

If these remarks serve to draw the attention of the profession to acute encephalitis as a possible cause of hemiplegia in children it will have fulfilled its mission.

ACUTE PERIOSTITIS.

BY ERNEST ROACH, M.R.C.S., ENG., L.S.A., LOND.

Late Assistant Demonstrator of Anatomy, Guy's Hospital.

ACUTE periostitis, as a formidable and even dangerous disease, should, I think, engage the serious attention of every surgeon. Its early recognition and subsequent decided and energetic treatment are highly momentous to the patient. Through unskilful treatment the usefulness of a limb may be permanently impaired by the disease, or it may require amputation, or the patient may lose his life altogether through pyæmia. On the other hand, the use of the limb and the health of the patient may become completely re-established.

Briefly, the pathology of acute periostitis may be summarized thus: The periosteum consists of two layers. The deeper which is applied to the bone is formed of delicate fibres of elastic and white connective tissue; it forms a kind of aponeurosis. The superficial stratum is much looser in texture and is made up of an areolar meshwork in which the vessels ramify and anastomose before penetrating the bone.

It is in this tissue that acute periostitis begins. At first it is swollen and red from vascular congestion; this is quickly followed by a rapid exudation of leucocytes and liquor sanguinis so that the membrane is converted into a purplish pulp.

The formed elements melt away and the débris mingling with the purulent exudation from the vessels, the abscess is fully formed. Thus we see that the periosteum is destroyed by the inflammatory process which meanwhile has spread to the surrounding soft parts (muscle, cellular tissue, skin, etc.) and has made them highly œdematous.

Etiology.—The disease is usually attributable to an injury, often slight, or to exposure to extremes of cold or heat: and here let me say that it has been my experience that an extreme cold following traumatism, almost invariably ensures acute periostitis. I shall subsequently quote one of my own cases in support of the above statement.

Symptoms—The earliest is sudden and severe pain in the affected bone which is soon followed by intense fever. On the second or third day swelling sets in, deep-seated and somewhat obscure at first; inflammatory signs approach the surface; the skin becomes œdematous and exquisitely tender, pits on pressure and finally reddens and inflames. The length of interval, of course depending on the thickness of muscles and soft parts covering the affected bone.

Other things being alike in respect of pain and amount of fever, the longer the delay in the appearance of external swelling, the greater the probability that the bone is the first and chief tissue engaged, the inflammation having reached the periosteum secondarily, while the early appearane of swelling and fluctuation externally, suggest that the inflammation is chiefly periosteal.

Diagnosis—There should be no difficulty as regards the diagnosis of acute periostitis; the only malady with which it need be confounded being an idiopathic inflammation of the deep-seated cellular tissue in a limb, and this disease is so very, very rare as to scarcely need elimination. Given the chain of symptoms above described in a young person, we may safely assume an osteoperiostitis. The disease almost invariably terminates in suppuration and necrosis; resolution happens rarely, but necrosis is not inevitable even after suppuration.

In speaking of the treatment, I wish to be very emphatic though of necessity brief. Incise down to the bone, dividing the periosteum. This is indicated even before pus has formed. Never wait for fluctuation or redness. If you don't hit pus with the knife you've done no harm and at any rate you have relieved tension and hence pain, and by permitting the timely escape of pus as soon as it does form the amount of periosteal separation and hence necrosis is limited. Enjoin entire rest

and elevate the limb. Bandage carefully to obtain uniform pressure and in the matter of drugs I have found nothing to equal the iodides. In conclusion there are cases especially in young children where, if the pus be speedily evacuated, the abscess collapses, the periosteum reunites with the bone and no necrosis takes place. This result is unfortunately quite exceptional. In hospital practice the cases are rarely seen early enough to admit of this result being obtained, and in private practice from its rare occurrence, is generally poo-poohed until too late.

The following is the brief history of a case under my treatment in February of the present year:—G. S. *æt* thirteen years, Toronto, fell off a toboggan, slightly bruising the tibia on the inner surface of the shaft three inches below the inner tuberosity. A week after the injury, of which the boy took no notice, he amused himself by making a snow tunnel in the garden in which enterprise he was compelled to lie on the ground on his chest and hands and his shins were also in actual contact with the snow for some hours.

Whilst attending another member of the family the boy's mother casually asked me to see his leg, of which he was complaining. Pain, heat and swelling (diffuse) were the points which struck me; backed by the history of traumatism and subsequent exposure to cold, there was no room in my mind for doubt, as to the nature of the disease with which I had to cope.

I immediately cut down on the tibia dividing the periosteum and evacuating what pus there was.

Three weeks afterwards, the incision had granulated up with no resulting sinus or necrosis.

My dressing consisted in lint soaked in a one in forty solution of carbolic, maintained in position by a bandage which I always carefully applied myself.

EDITORIALS

THE UNIVERSITY MEDICAL FACULTY.

"From one stage of our being to the next
We pass unconscious o'er a slender bridge,
The momentary work of unseen hands.
Which crumbles down behind us; looking back,
We see the other shore, the gulf between,
And, marvelling how we won to where we stand
Content ourselves to call the builder Chance."

Lowell.

WE may be mistaken, but we incline very much to the opinion that several of the members of the old staff of the Toronto School of Medicin might fitly express their sentiments in such poetic language as the importance of the occasion has recalled to us. Truly, indeed, have they passed from one stage to another over a slender bridge, the work of unseen hands! Little did the students suppose last April that "Toronto School" would know them no more, and that their astonished eyes would behold on opening day

"A brilliant line
Of twenty-nine"

from whom to receive in future all knowledge by any possibility pertaining to the *healing art*; while some of the twenty-nine,

"Marvelling how we won to where we stand
Content ourselves to call the builder Chance,"

have doubtless several times recently made their bow to said conspicuous personality. But now that the slender bridge has crumbled down behind them, the gulf between, it is our privilege to view them as they stand, the Medical Faculty of the University of Toronto.

Speaking generally, every one, looking from an independent standpoint, must consider the change a move in the right direction, and in the interests of medical science; hence the Minister of Education and University Senate on the one hand and the Toronto School on the other are to be congratulated on the happy Chance whose "unseen hands" drew the one to the other. Had she done her work perfectly, she would probably have left several behind, or dropped them in "the gulf between." It is really too bad though that said hand did not similarly give Trinity an effectual pull; but, my! what an aggregation there would then have been! Twice twenty-nine less eight = 50; still that would have left, according to our nosology, twenty diseases for each, so perhaps it would not have been too many. It strikes us, however, when the Minister did undertake so much and found it practicable that, in addition to the old "science staff" of University College and School of Science, one or two more regularly paid professors should have been added, thereby not only greatly extending the efficiency of the school, but also making it

less possible for the critical to say, "cauld kale het again." Should this have implied the withdrawal of several from the old Toronto School staff it ought to have been possible to have given such compensation as would have done an injustice to no person. From all we can learn, Trinity School is determined that no part of her old-time energy, which, personified in her Dean, has made that gentleman at least distinguished, shall be lacking in order to maintain the credit which with reason has in recent years rightfully been hers. Surely, as regards the "Women's Medical," their well-known gracious acquiescence *when asked* ought not to make it difficult for them to join hands with the gentlemen of the "New Combination," and henceforth joyously travel life's pathway as one.

MEDICAL LIBRARIES.

SAID some one the other day after Prof. Ramsay Wright's Address, "Surely the reason why Prof. Wright gave us such a dissertation from old medical books is that he had no new ones to consult." Certain it is, at any rate, that, with the disappearance of the old Faculty of Medicine, University College Library, in books *medical*, surceased. Perhaps it has been that that royal munificence, of old found so necessary to the establishment of libraries, has been wanting, or perchance the passion of the librarian as a collector has not tended toward Medicine. Evidently "the affection, or the veneration, which civilized men have ever felt for these perennial repositories of their minds" has not been such on the part of *Senatus Universitatis* as to cause it to purchase works on Medicine. Perhaps its financial resources have been mostly devoted to teaching the art of *healing breaches*, as promoting federation, or showing the Toronto School the beauties of the "new connection"; and yet the first national library "seemed to have been placed under the protection of the *divinities*" whose statues adorn it, and to have had engraven on its front, as Diodorus has it, "The medicine of the mind." But with so many recent evidences of progress in Medicine on the part of the Senate it is quite possible that a new surprise is in store for us, and that through its munificence a "coming race" of medical *lectors* will soon be addressing the occupants of burdened shelves.—

> "Salvete aureoli mei libelli
> Meae deliciæ, mei lepores."

If not from affection, may our Senate attend to the matter for her own credit, else can she no longer exclaim, "*Palmam qui meruit ferat*"; for we understand on good authority that, after some doubt as to the propriety, for fear of contagion, the Ontario Medical Council has decided to set apart a room in the new "College" in which the medical *friends of learning* in the Province, after giving of their substance to the extent of $10,000, may store the literary products of their purchase. Speaking seriously, we compliment the Council on its gracious act towards the Ontario Medical Library Association, if such be the exact title, and trust that its generosity, with the funds paid into the coffers by the profession, will return to it as "bread cast upon the waters," and that every facility will be afforded medical men, whether from without or within Toronto, to utilize the new library to the fullest possible extent. With somewhat more than 2,000 practitioners in Ontario, it does not seem difficult to have the idea of the library extended and make the College of the Council, what Toronto is in name and reality, "a place of meeting" where, as Piquet said of it, "The wine here is of the best."

As there seems to have been some doubt on the part of the members of the Library Board as to how flexible the rules for membership of the Association should be, we would say that it is sincerely to be hoped that, while by the establishment of a Provincial Library we are proclaiming the advance toward a higher ideal of liberality and nobility in the profession, no obstacle will be placed in the path of him whosoever he may be that is a "seeker after truth."

As the time for the first payment of stock is due, we trust we are not interfering with the work of the Committee when we say to our readers that stock is placed at $5 a share, payable in five yearly instalments to Dr. J. E. Graham or Dr. G. Wishart, Toronto.

ELECTRO THERAPEUTICS.

IN devoting a certain amount of space to electro-therapeutics we wish our position in the matter to be thoroughly understood.

In the first place we do not believe that electricity is by any means the curative agent that some consider it. Secondly, we do not consider it so much better than any other remedial agent that we

should have a certain space sacred to it more than to many others. But we do believe that in many instances it will prove a valuable weapon in combatting many forms of disease, such as, chronic inflammations in the pelvic cavity, which but a short experience in gynæcology teaches us to dread.

Now in order to fully arrive at the amount of benefit to be ultimately obtained from the use of electricity, it is necessary that it should be rescued from the hands of quacks, and applied scientifically, and definitely by the educated physician. Scientifically in as much as the old method of using 4, 7, or 12 cells is about as far removed from scientific accuracy as it can well be, because the strength of the current depends, 1st, on the kind of cell, 2nd, on the exciting fluid, 3rd, on the length of time the battery has been in use and 4th, on the number of times the battery has been used since it was first set up. All these causes combine to make the old method of current measuring utterly useless even comparatively, and especially must it be denounced when later science has given us the means of measuring cheaply and accurately the strength of current and enables us to determine the dose of electricity more accurately and quickly than we now dispense any other remedial agent.

Definitely because the physician, who knows exactly the malady, its natural course and termination, and the thousand and one other minutiæ about the disease which only the physician does know, watches the course and effect of his remedy with that trained habit of scientific observation which is part of his life and nature. Therefore, it is only from him that we can expect to receive that accumulation of data and details which will enable us to judge calmly and reasonably for or against electricity in its various uses. Electricity in its scientific mode of application as above described, its dose being registered, the best method of administration in each disease being known, is a late development in therapeutics and, as our knowledge is being constantly added to, it becomes necessary to keep up a certain continued record of its advance as well as a place where the results of treatment may be chronicled as each physician completes his cases. It is only in this way that we can ever be in a position to take a definite stand as regards this one of our latest therapeutical measures.

Our neighbors across the line are making great additions to their present knowledge, and we wish our Canadian physicians to aid us in advancing ours in this department of MEDICAL SCIENCE.

LONDON WEST SEWAGE GRIEVANCES.

THE general public, and perhaps some of the medical public, have doubtless been wondering, what, and why it is, that at intervals during the past six months the daily press has published reports regarding London and London West in which, according as either Board of Health or Council had met, has indicated a determination to do something desperate. The trouble between the two municipalities may be said to date back to that fatal night in July, 1883, when a storm of unprecedented violence so filled the two branches of the Thames conflowing at the south-west of London city, that the piled up waters flooded the flats to the west on which the town of London West is situate. London West has ever since naturally felt that so long as the Water-works dam on the river below the city holds up the water, floods may occur at any moment: while in addition they state that owing to several dams being on the river, the sewage of London, largely poured into the river, seriously affects, through pollution of the water and its deposit along the banks, the health of their town. London city on the other hand naturally wishes to maintain so valuable a water-privilege as the dam which gives enough power to supply the city with its water, and states that if London West people kept their outhouses, cellars, etc., clean the malarial diseases, typhoid and diphtheria now prevalent, would in a large measure disappear. The question of whether the upper dams are a naisance, under the Health Acts, has been decided in the affirmative; but references, etc., have hitherto prevented any execution of the determination of the Court. Thus, stated briefly, the London sewage question has become one of exceeding interest and importance to the public and to medical science. No one can doubt that, were London sewage passed directly into the centre of the river and carried down without any obstruction, both towns would be free from possible danger; but it must not be forgotten that London is growing into a large city and that polluted river water does maintain its impurities much longer than used to be supposed. Thus

Hudson river water according to Prof. Perkins shows steadily increasing contamination from Schenectady to Albany. At Albany the water commissioner has condemned Hudson water as unfit for use and *drive* wells are being tested. Ice supplies tested have similarly shown increasing impurities. We thus see that a time arrives in the history of the growth of towns and cities on rivers at which pollution can be calculated, and its dangers positively estimated. In England the Alkalies Acts long since set limits to the practice, and out of this law, under the able administration of the late Prof. Angus Smith, have arisen some of the worthiest scientific experiments, and, at any rate partial, solutions of questions thought almost too large to touch.

Surely the *Naiades* must have vanished from the streams through some such profanation by sewage of the limpid waters of their fairy abodes, and may it not be that

"The great god Pan
Down in the reeds by the river,"

indulged in somewhat too much of the erst crystal stream and through a fatal typhoid supplied a subject for the dirge,

"Pan, Pan is dead!"

HOUSE-WARMING.

THE discussion of this question of vital importance both to the comfort and health of every one becomes of special interest at this season of the year. Not only is every one asking by what means can heating be done most economically, but he also wishes to feel that such economy is compatible with the highest possible degree of health. To us as physicians, however, the matter becomes one of paramount importance, since upon methods of heating we shall have to look for causes of ill-health not otherwise very well explainable, and must endeavor in such cases, to explain some of the details of improvment in house warming.

Speaking generally, there are three principal conditions in the atmosphere of rooms in which, under even so-called good heating, there are great variations from the normal external air. They are *(a)* purity, *(b)* distribution of temperature, *(c)* moisture. Doubtless they are all intimately associated; but a few remarks on each will not be out of place.

Purity of house air.—When we remember that the general rule of ventilation, as set down by De Chaumont and others, limits the changes in the air of a room to six within the hour, if draughts are to be prevented, it is apparent that the air must be of a wholly different nature from that outside when at an ordinary breeze of six miles an hour the air about a person would be renewed 30,000 times. But when we further consider that it is only with best systems of ventilation that the air of a room is changed thus often, it is evident that impurities in the air of rooms are invariably present, and often in large degree. Carbonic acid from the lamp, from gas-lights and base-burners; carbonic oxide from stoves and super-heated furnaces; organic emanations of a particulate character, and bacteria from impurities in the rooms and under them, are all measurably present. As a single instance, Miquel states, that while the outer air of Paris had during three years the following relative number of microbes, viz.: autumn, 121; winter, 52; spring, 70, and summer, 92, per cubic metre, the number in Salle Lisfranc of L'Hôpital de la Pitié were during 1881, 1882, autumn, 56,700; winter, 52,800; spring, 32,300; summer, 19,300.

Distribution of temperature.—In outer air in cold weather we notice within a given space no change of temperature apart from unequal exposure to wind; but within doors it is different. The air of a room as ordinarily heated in winter will show a difference of from 10° to 20° F. between that at the floor level and six feet above. Again, while the air along an inner wall may be at 66°, that near the window may be near freezing point and that near the ceiling at 80° or 90°. When it is remembered that the ordinary stove or grate may utilize an hundred cubic feet of air per minute, it is apparent that it must be replaced in the room by air being drawn along the floor, through cracks in the floor, etc., draughts of a most dangerous nature being thus created. These great differences of temperature, even in small rooms, are the cause of equally important differences in the relative humidity of the air of the room.

Moisture.—In external air the relative humidity or degree of moisture is about 75 per cent. of complete saturation. Since the capacity of air for moisture is doubled with every 27°, it is apparent that if house air at 66° has normal humidity, a reduction of temperature of 20° must raise it to near saturation point. Conversely if external air at or

below freezing is introduced in a room heated to 66°, its relative humidity must thereby be reduced to a point much below the average. We thus see what are the common variations in house atmospheres. It is generally stated that a normal house atmosphere stands at 66° : but whether this is compatible with agreeable sensations will depend largely upon the two factors of equable distribution and normal humidity. We may ask ourselves, Why ? All bodies lose or gain heat by radiation, by evaporation and conduction. If air have a temperature too low, body heat is radiated too rapidly, in proportion to the number of degrees of difference ; evaporation is, however, lessened both from the body and lungs, since the cold air is more damp. Conduction, however, will be more rapid, since the damper the air the better as a conductor. Again, if the air of a room be too dry, evaporation is so rapid as to produce a chilly sensation, and this doubtless, is the reason why in many houses heated with furnaces, hot water or steam a temperature of 66° seems too low for comfort. Practical tests with cold air introduced, warmed, into a room at 67° have shown its relative humidity to be less than 50°. Let any one observe the facts in his own rooms and he will find how true these statements are. Statistics are not necessary for us to appreciate the effects of such conditions upon a population who live at least six months within doors ; what we want is to know how to apply the remedy. Clearly, ordinary stoves are in every way objectionable ; but, if they must be used in the meantime, it will be well if we urge that the females and young children, so much indoors, do, when not actively engaged, live up stairs as much as possible. The upper floors are warmed from the ceilings below, and outer cold air will come in by the doors of the ground floor and be warmed in its ascent. For the same reason, and especially to prevent draughts, we should have our sick-room upstairs. For purity of air in such rooms an outer sash with opening, with the inner window drawn down, will greatly facilitate its even distribution. Regarding moisture, evaporating pans placed on the stove are clearly a necessity. But in this age, with the marvellous application of scientific discoveries to the practical business of life, we cannot expect so crude a thing as a stove to be long the solution of the problem. What we need after a good economical heater, is warm air of proper moisture regularly and sufficiently introduced into rooms, and as systematically extracted, along the outer walls and floors with hollow spaces in which warmed air will at once remove in large measure the difficulties of variable room temperatures, caused from radiation and conducting away of heat by outer walls.

We shall return to the subject, hoping that, in the meantime, we have said enough to arouse interest and promote the discussion of the subject, and shall be glad to publish practical articles regarding it.

INDEX OF PROGRESS

SURGERY

The Development and Repair of Bone.

A very able article on the subject of the "Osteogenic factors in the development and repair of the bone" appears in the *Annals of Surgery* for October, from the pen of W. Macewen, M. D., *Surgeon, Glasgow Royal Infirmary*. The writer begins his paper by stating that although the periosteum has long been regarded the chief factor in the development of bone, and that more recently the medulla is considered to have something to do with its regeneration, yet observation and experimental enquiry prove that neither of these is the potent factor in bone development and repair.

The periosteum is the medium through which the bone receives a portion of its blood supply. The free inosculation of the nutrient arteries from the periosteum will allow of considerable portions of bone to be denuded without causing its death. The author asserts, however, that the soft tissues enclosed in the osseous tissue play the chief role in the development and reproduction of bone, and follows up this assertion with the enunciation of of several propositions and demonstrates each by the selection of cases from the numerous observations he has made.

"*Proposition A.— When the periosteum has been mechanically detached from an extensive area of an adult healthy bone and replaced after the lapse of some hours, union between the bone and the periosteum can take place without sloughing or observable augmentation.*"

The cases selected to illustrate this proposition are those of accidents whereby large flaps including the periosteum have been peeled from the bone —scalp wounds, injuries to the extremities, etc.— These flaps having been cleansed, rendered aseptic, and carefully replaced, have united firmly, without pus formation, and examination many months afterwards showed no shedding of bone or observable osseous thickening. In the cases reported from two to four hours elapsed from time of accident to the replacing of the flaps.

"*Proposition B.—The periosteum may be separated from the bone for a period of days by inflammatory products, after the withdrawal of which reunion between the periosteum and the bone may take place without necrosis ensuing; showing that the temporary separation of the periosteum from the bone, even as a pathological result, is not necessarily attended by death of bone.*"

The examples given to prove this fact are those of acute periostitis and of subperiosteal abscess. A subperiosteal abscess of the femur of six days' duration involving the lower two-thirds of the shaft completely elevating the periosteum from the osseous cylinder, is cited, and another, symptoms of the attack being present for eight days, involving the femur from the great trochanter to the condylar epiphyseal line, raising the periosteum from the whole of the anterior part of the shaft, while behind were left only some adhesions around the situation of the femoral nutrient vessels.

In both these cases free incisions and thorough drainage led on to perfect recovery in a few weeks. These cases were examined, the one six months, the other a year afterwards. The first mentioned showed no discernible thickening and the patient was in possession of the full functions of the limb. In the latter there was a slight peripheral increase but the patient walked to work daily, a couple of miles, and only experienced slight fatigue and sense of weight in the limb when over-exerted.

"*Proposition C.—The periosteum covering a portion of bone may be completely destroyed or permanently removed, yet the denuded bone may not only retain its vitality, but may throw out cells which will cover it and form a new periosteum.*"

The first case cited as an instance of this kind is that of a young man, who received an injury to his left lower limb, whereby the whole of the soft tissues were removed from a portion—two inches by six inches—of the inner and anterior aspect of the tibia and the bone scraped and furrowed. The flap, including the periosteum, was so crushed that it died, leaving the bare bone exposed. Three days after the injury, by the aid of a hand glass, numerous small points of granulations were seen on its surface. On the seventh day the granulations had mostly coalesced and by the tenth day they had united in great part with the granulation tissue at the periphery of the wound. On the fifteenth day the bone was entirely covered by an uniform layer of granulation tissue, which in six weeks had completely skinned over.

The author remarks in this case that the deepest trenches were those which were soonest filled with granulation tissue, and that the parts of bone that had barely been scraped at all showed much less active vitality than the deeper portions. This is accounted for by the fact that the most superficial part of the cortical layer of an adult bone is more dense and therefore less vascular than the deeper.

"*Proposition D.—A portion of bone which has its continuity severed on all sides, and at the same time has had all its periosteum removed, is capable of living and growing.*"

Several observations are given to establish this fact. Amongst others is that of a man who received a compound comminuted fracture of the right tibia about its middle third. A portion of the tibia, an inch and a half long, an inch broad and three-quarters of an inch thick, was completely detached and stripped of its periosteum. It was taken out, washed in carbolized solution and replaced in its proper position. For ten days it lay exposed in the wound, its surface presenting a whitish appearance with minute red spots. These spots were minute blood-vessels appearing at the orifices of the Haversian canals. Innumerable islands of granulation tissue soon sprang up, these coalescing the wound soon cicatrized and healed firmly. There was no necrosis. Examined eight weeks later it was found that perfect osseous union had taken place.

"*Proposition E.—Not only do detached portions of bone deprived of their periosteum live when reimplanted in their original positions, but such portions are capable of living after transplantation. Parts of deeper layers of bone which had no periosteal connection have been transplanted and have lived and grown.*"

Amongst other cases cited to demonstrate this proposition the author gives a résumé of a communication made to the Royal Society, London, in 1881. It is that of a boy *æt* 2 years, who lost the shaft of the humerus from suppurative periostitis ending in complete necrosis of the humeral diaphysis. The necrosed bone being removed, the whole space granulated up without the formation of a new bone from the periosteum which had been left *in situ*, the result being a flail-like arm.

Fifteen months afterwards the condition of the arm was as follows:—No increase in length of arm—barely two inches from acromion process to distal extremity of humeral shaft—the proximal fragment tapered to a point—from this point to the condyles a complete absence of bone—could not raise his forearm to his breast—the muscles were intact—the power was there, the lever and fulcrum were wanting.

It was determined to transplant bone from the tibiæ of a patient with anterior curves.

An incision was made down to the head of the bone of the humerus and continued downwards, a sulcus was formed in the anatomical line of the shaft for about two inches. Into this sulcus were placed minute fragments of bone chiseled from the two wedges that had been removed from the tibiæ alluded to. The tissues were drawn over these and the wound healed without pus production. Two months after a portion of bone an inch in length and three-quarters of an inch in thickness, was found firmly attached to the upper fragment.

Two other larger wedges of bone were similarly dealt with, and inserted two months after the first graft and a third couple, five months after. These filled the gap in the arm to the extent of four and a half inches, the last graft uniting with the distal fragment.

Examined seven years afterwards the arm, though shorter than the sound one, had increased in length one and a half inches. The circumference had also increased considerably and was somewhat irregular. The patient could use the arm for a great many purposes, taking his food, adjusting his clothes, and in many games.

These results present some unexpected facts, if we are to judge of the prevalent views regarding diseases of bone before the days of anticepticism. Truly the surgery of to-day has advanced even in the country of the immortal Syme.

MEDICINE

Diagnosis of Stricture of the Œsophagus.

Alexander Ocston, Prof. of Surgery, Aberdeen University, says diagnosis of stricture of the œsophagus is by no means always easy.

Difficulty of swallowing and regurgition of food, similar to those present in stricture, is sometimes complained of in dyspepsia and even in bronchitis with emphysema. The like symptoms may be observed in paralysis of the gullet after diphtheria.

Stricture at the lower end is generally cancerous and occurs in subjects after middle life. These are the easiest cases to diagnose. The painful sensation of distension after swallowing solid food felt above or at the epigastrium, in the centre of the thorax and producing breathlessness and distress is very distinctive if well described. But we are dependent on description, and some patients cannot describe the sensations in terms that we can satisfactorily recognize. Besides, it must be remembered that the sensations we have all felt after hastily swallowing much puffy food or large morsels is the same as that in stricture, and occurs, therfore, in normal persons. When a stricture is present and is not very narrow, it is not always possible to decide by this sign alone. Here the probang or œsophageal bougie is a valuable instrument; but it has its disadvantages. If a small probang is used, it will pass the stricture without detecting it; it is also dangerous. Many consult their medical attendant for the first time, not because they have the stricture, but because it is unusually troublesome at the time. Peri-œsophageal irritations, tending to suppuration or ending in abscess, are common in such patients, and if a probang be passed at such a time it sometimes perforates the wall, and at all events usually aggravates the condition or determines the formation of abscess. Besides, a probang may lead to a mistaken conclusion. I have seen one passed down so far that its handle tip was within an inch of the lips, and the operator declare there was no stricture, while on pushing it further so as to lodge its tip within the mouth, as can be done in a healthy person, it was arrested by an evident stricture.

Stricture of the upper end is generally due to cicatrix, valvular or annular, following a scald, the swallowing of caustic liquids, diphtheritic or syphilitic ulceration, or the like. It is usually

found in the young or in persons under middle age. Its diagnosis is the most difficult. It often is easy enough, but not unfrequently requires a good deal of care. The visible efforts of the patient and outward distension of the pharynx, in the efforts to pass on what is swallowed, are often very striking when the neck is looked at, for these strictures are often narrowest of all, and will admit only a fine probe or even a filiform bougie. The action of the pharynx, however, is not unlike what occurs in diphtheritic paralysis. The probang here may often mislead, since there is normally an obstacle, and a very decided one, to its passing the larynx, and it is possible to mistake the natural for an abnormal resistance, or *vice versa*.

Hamburger mentions the rapidity of the passage of the food along the gullet as being valuable as a diagnostic sign, but he does not enter into particulars regarding it. Yet, I have, I think, found it most valuable.

A healthy person requires about four seconds for food to pass from the mouth to the stomach. The moment of its leaving the mouth can be told by placing the finger on the pomum adami. The instant it is felt to rise the fluid is passed from the pharynx into the œsophagus. If the ear is placed behind the left thorax, three inches below the angle of the scapula, the moment of entrance into the stomach can nearly always be told by a distinct amphoric gurgle or amphoric rushing sound. Even when this fails to be audible once it seldom does so at a second attempt.

The watch in one hand and the finger of the other on the pomum adami, serve to record the exact time. The patient retains the water or other fluid in his mouth till he receives the order to swallow.

Stricture impedes the passage of food. It does so even when the food is fluid and the stricture not narrow. The same thing is observed in strictures elsewhere—e.g., in the urethra where even a stricture that would not be called narrow causes straining and a delayed escape of urine. When auscultation and a measurement of the time needed for a liquid to traverse the whole length of the gullet are employed in a case of œsophageal stricture, it will generally be found to require 14 or 16 seconds.

A number of individuals without stricture were tested as to the time required for liquid to traverse the œsophagus. The numbers were 11, 3, 4, 5, 8, 6, 3, 5, 8, 3, and 2½ seconds. When the patient is sitting or standing upright, and is in sound health, four seconds is the usual time. This symptom may be inapplicable or mislead occasionally, I do not doubt; but I have found it a very useful and reliable one, and am inclined to place a good deal of value upon it.—*Medical Chronicle.*

THERAPEUTICS.

Electro-Therapeutics.

The first experimental observations on *static electricity* were obtained by the friction of a piece of amber. This substance, on being rubbed, became endowed with the power of attracting to itself such light substances as feathers, pieces of paper, etc. It was not long before it was noticed that, on friction, other substances, such as glass, sealing wax, etc., developed similar qualities, and following on this an examination of the properties of this peculiar power showed that it was of two kinds. This is easily illustrated. Heat a piece of sealing wax and draw it out to a thread about the thickness of a knitting needle and eight or ten inches long. To one end of this fasten a paper disk about an inch in diameter and suspend the whole, so that it balances freely, from a glass rod by means of a few fibres of unspun silk. Now, if we rub a stick of sealing wax with a piece of flannel and bring it near to the paper disk, the disk will be at first attracted and then repelled by the wax. If, while in this state of repulsion, we bring near to it a warm glass rod which has been rubbed with a piece of silk the disk will be immediately attracted by the glass and then in an instant repelled. If, while the disk is in this condition of repulsion from the glass, we again bring near to it the excited sealing wax it will be attracted by the latter. Thus we see that a body which is electrified or charged by the same kind of electricity as is obtained from the wax is repelled when a piece of electrically excited wax is brought near to it, but is attracted by the glass rod and *vice versa*. To indicate these opposite kinds of electricity, that developed on friction of glass is termed *vitreous or positive* electricity, while that from the wax is termed *resinous or negative* electricity. These terms are comparative only and indicate that there are two kinds; they might be used interchangeably. Whenever two bodies

are rubbed together both kinds of electricity are produced and in equal quantities. Thus, if we stretch a piece of silk over a brass plate and rub it with a warmed glass rod, while the rod and silk are in contact we can bring them near to the disk above mentioned without it being in the least affected; but if we separate them and bring the glass near to the disk the latter will be at first attracted and then repelled; and if, while in this state of repulsion from the glass, the silk be brought near to it, it will be attracted. Therefore we see, that in the combination of the glass and silk we had the two electricities developed on friction: so long as we kept them together they had no effect on the disk, therefore they must have been equal in quantity, and we have shown that they are opposite in action, so they exactly neutralised each other. Without discussing the various forms of apparatus for producing electricty by friction, etc., we will consider what is known as *voltaic electricity*, as it is of the greatest therapeutical value. It is well-known that no chemical action can take place without the production of electricity. Voltaic electricity is that form of electrical energy set in motion by chemical action and is produced by the contact of two dissimilar elements in the presence of a liquid. If a plate of zinc is immersed in dilute sulphuric acid, the zinc will be dissolved and hydrogen gas given off; but if the surface of the zinc, after being thoroughly cleaned, is rubbed over with mercury, an amalgam is formed which will prevent the action of the acid on the zinc for several hours. The reason for this is not exactly known, but the fact itself is constantly made use of. If we place one of these plates in a vessel containing dilute sulphuric acid no action occurs. We may also put in a second plate and still no action occurs, even if we allow the plates to touch one another; but if we replace one of the prepared zinc plates by a copper or platinum plate, no action ensues while the plates are separated, but immediately on allowing them to touch each other, chemical action ensues and the zinc is dissolved, hydrogen being at the same time liberated from the platinum plate; the latter, however, is not in any way acted upon. It is not necessary for the plates to be in actual contact, because some medium such as metallic wire, piece of graphite, etc., *i.e.* any *conductor* of electricity, may be used to connect them; but if, while they are in contact, some substance such as glass, wax, shellac, etc., *i e. non-conductors* of electricity, be interposed the action, which has been going on, immediately ceases. Thus we see that there are substances which will allow the electric current to pass along or through them and others which will not. This is of practical importance to us, as by using a *conductor* to convey the current to the point at which we want to use it, and, at the same time covering portions of our conductor with some *non-conducting* material, we may protect any of the surrounding tissues we wish. This process is known technically by the term *insulation*. The *voltaic circuit* produced, when two dissimilar metals are connected with one another in the presence of a liquid which acts chemically upon one of them, has other effects to be considered outside of the action in the cell. We will consider the phenomena produced by the passage of the current along the wire which connects the two plates. First, we have heat developed by the molecular friction of the current. We utilize this action in our galvano-cauteries. Second, we have the influence exerted by the wire over a magnetic needle. If a magnetic needle be placed parallel to a wire in circuit it will tend to place itself at right angles to the wire. All parts of the circuit, including the liquid in the cells, have this action. On this basis there has been constructed an instrument—the galvanometer—for detecting and measuring the most delicate currents.

W. B. N.

Effects of Antipyrin.

Antipyrin is receiving great attention for the remarkable anodyne effects it produces, which allied to its undoubted antipyretic qualities make it a most valuable drug. Germain Sée, in his report to the Academy of Science, on the action of antipyrin, subcutaneously in place of morphine, gives it unqualified praise. The ready solubility of the drug makes it especially valuable in this way. He injects 8 grs. dissolved in 8 minims of distilled water given as one dose. In chronic articular rheumatism 3 injections with 35–60 grs. daily for some time, gave excellent results. In neuralgias, lumbago, etc., it has cured pain. In patients suffering from biliary calculi, it gives the best results—here it has the advantage over morphine that it does not affect the secretions;—in nephritic colic it has the same advantage over morphine as above. In painful heart affections and angina pectoris; in

severe dyspnœas, as in asthma, it is useful; it promotes and facilitates expectoration without affecting the secretions. In fact he considers that it will replace morphine in every instance, without the ill effects of that drug. Against the above we see, in the *Therapeutical Gazette*, some valuable warnings of the dangers of antipyrin. In an editorial in their number for August they give some cases in which death was undoubtedly caused by antipyrin, and that not only with large doses, or in the doses 35–75 grs. recommended by the discoverer Filenhe, but in one case of Guttmann's a dose of 15 grs. nearly caused death.

The *Gazette* says, however, that there is no reason for giving up antipyrin on this account, as morphine has a much more unenviable record and that with all powerful drugs we have persons whose idiosyncrasy will not allow of their use. However, it would be well to be guided by their recommendation and commence with a dose of 7½–10 grs. watching the effect. In administering the drug it is usual to follow it with a stimulant as ℥ss. of brandy. Death occurs from prostration.

Administration of Anthelmintics.

In treating to expel worms the anthelmintic should always be suspended in some oleaginous material, as when not so suspended the greater portion of it is absorbed while in the stomach whereas the oils pass on into the intestines and bring the drug in direct contact with the parasites.—*Medical Chronicle.*—[We have been in the habit of giving drugs, for these purposes, in smaller doses frequently repeated for a day, and then a smart purge. Our object is to keep the parasite constantly acted on by the drug; especially is this desirable in the case of tænia and the combination with oil should greatly increase this action.—Ed.]

Chloride of Methyl in Neuralgia.

At a recent meeting of the Société Médicale des Hôpitaux M. Debove made some remarks on the use of chloride of methyl in neuralgia. Since his last communication to the society in 1884 M. Debove has treated 150 cases of sciatica with this medicine, and found only one case in twenty that was not amenable to its action. Lumbago and neuralgia are cured by chloride of methyl almost instantaneously; in case of relapse, the pain easily gives way under its influence. Erythema should never be produced in the treatment, the action should be rather superficial, and the greatest number of nerve branches possible should be excited. Great precaution should be taken with patients affected with diabetes and albuminuria, and also with patients whose skin is very irritable. Out of eighteen cases of facial neuralgia, sixteen were cured in this way. The medicament may be sprayed on the face without inconvenience.

Iodol Poisoning.

The *New York Medical Journal* gives an account of a case (Pallin; Hygiæ, *Ctrbl. f. Chir.*) of necrosis of the clavicle, in which, after removal of a sequestrum, 75 grs. of iodol were applied to the wound. During the evening of same day delirium ensued; next day temp. 102.2° F, pulse 136, small and irregular. He vomited and was apathetic. The urine, on examination, gave traces of albumen and also a weak reaction of iodine. The wound was immediately redressed, all the iodol being washed out, and bismuth applied instead, yet the symptoms of poisoning remained for four days, and the iodine did not disappear from the urine for a fortnight.

Coumarin as a Corrigent of Iodoform.

The *New York Medical Journal* states that A. Langlebert (*Gaz. de Gyncol.*) recommends coumarin both as a deodorizer of iodoform and as an adjuvant to that drug as an antiseptic: about one part of coumarin should be used to every five parts of iodoform. [As two noted German investigators, Heyn and Roysing, have denied for iodoform any antiseptic power whatever, and even go so far as to state, as a result of their experiments on inoculating the eyes of a rabbit with tubercle, the virus for one eye having been rolled in iodoform before being used, that the eye, in which iodoformized tubercle was placed, first showed signs of miliary tuberculosis. It would seem, therefore, that in as far as its antiseptic powers are concerned iodoform is in need of an adjuvant.—Ed.]

Arsenic in Skin Diseases.

Although arsenic has been used in almost all forms of skin disease there are only two in which it is of real value, psoriasis and pemphigus. Commence with 5–6 drops Fowler's solution, and gradually increase.—*Dr. Gottheil, New York Polyclinic.*

OBSTETRICS.

Anæsthetics in Labor

As early as 1847 Simpson administered ether to a woman in labor, and from that day to the present time anæsthetics have been employed to a greater or less extent in the practice of midwifery. That the practice is a sound one in certain conditions is acknowledged by all, and that it might be more universally practised is acceded by many. The object of this article will be to show, by a short *resumé* of the existing literature on the subject, that the administering of anæsthetics in labor is not only authorized and justifiable, but also oftentimes imperatively called for. It is principally in that class of women which may be called nervous or high-strung that anæsthesia is serviceable. In the earlier stages of labor, when the pains are acute without making much, if any, perceptible dilatation of the os and cervix uteri, chloral hydrate is of benefit. Playfair recommends that 15 grains of chloral be administered every twenty minutes until three doses are given; this generally produces the desired drowsy effect, though, if necessary, a fourth dose may be given, at a longer interval, say an hour, after the third dose. Referring to this drug, he says, "When the patient is brought under the influence of chloral the pains become less frequent, but stronger, nervous excitement is calmed, and the dilatation of the cervix often proceeds rapidly and satisfactorily. Indeed, I know of nothing which answers so well in cases of rigid undilatable cervix, and I believe its administration to be far more effective, under such circumstances, than any of the remedies usually employed."

Again, in the words of Dr. Partridge, of New York, "Chloral renders useless pains efficient, it overcomes rigidity of the cervix, calms excitement, and diminishes suffering." The administration of chloral in the first stage also paves the way for the use of chloroform in the second, as in the semi-unconscious drowsy state produced by the former a far smaller quantity of the latter is required, and the slight risk, always incurred in the administration of chloroform, is further removed,

In the second stage of labor chloral is of little benefit, and here it is that chloroform should be used.

If properly administered the risk is *nil*, and we believe there has yet to be reported a single instance of death from chloroform in obstetrical practice. The popular idea that it prolongs the suffering of the woman is a fallacy. In the words of Fordyce Barker, "It accelerates rather than retards labor." Again, referring to the perineum, the same author says, "Long continued pressure of the head may produce congestion and inflammation of the perineum, which not only renders it more unyielding, but more easily torn. It becomes hot and dry, and very painful, and uterine action becomes irregular and feeble, in consequence of this condition. Now, under these circumstances, I have seen the inhalation of chloroform followed by immediate relaxation of the perineum, and a restoration of the normal moisture and temperature of the parts, while efficient action of the uterus was at once resumed. The mode of administering chloroform is of great importance. It should be given slowly and sparingly during the pains, not during the intervals. It should not be given to the full anæsthetic effect, unless with a direct object in view, such as to retard labor where the pains are fast and strong, and the perineum not sufficiently distended, or, in the case of operative interference, as in version, application of forceps, etc.

In an able paper on the subject of anæsthetics, Dr. A. B. Miles, of New Orleans, condemns the practice of administering alcoholic stimulants before chloroform in the following terms: "The use of alcohol in this way is objectionable. We cannot rely on the absorption from the stomach at the very time its stimulating action is most desirable. If given immediately before the anæsthetic, it is not absorbed in time to sustain the centres, as they undergo primary anæsthesia. If given in time for absorption, the alcohol antagonizes the action of the anæsthetic. Alcoholic patients are difficult to anæsthetize, and while under anæsthesia, they often show alarming symptoms."

That chloroform freely administered predisposes to relaxation of the uterus, and hence to *post partum* hæmorrhage, is acknowledged by all obstetricians; but it is only when it has been freely administered that this danger exists, not when given in the manner above described and for the relief of pain.

While we do in no sense incline to the practice of allowing the patient to decide, by her ideas of personal comfort, as to the use or disuse of an anæsthetic, still, in many instances, we deem them not only safe, but necessary.—[P. J. S.]

DISEASES OF CHILDREN.

Convulsions in Children.

It often puzzles us to readily explain the cause of one of the most common symptoms we are called to treat.

We have been in the habit of keeping in our mind a table somewhat after the nature of the following, and knowing what time and trouble it has in many instances saved us, we present it in the hope that some of our brother practitioners may find in it some useful hints. We must remember that convulsions in children very often, if not usually, take the place of a chill or delirium in the adult, so that the convulsion may be but the onset of one of the exanthematous fevers, etc. Amongst the commonest causes are :

1. *Indigestion*, or severe gastric disturbance, from the presence of some irritant or trash which the child has been eating.—Remedy : Emetics. The best is a hypodermic injection of apomorphine 1-20 to 1-10 grs.

2. *Constipation*, or intestinal obstruction of any kind. The convulsions are due, in all probability, to the absorption of leucomaines. Enema, and then castor oil, or castor oil and rhubarb.

3. *Intestinal irritation*, from worms, or lodging of some foreign substance in canal, such as plum or cherry pits, etc. Remove cause. For worms, santonine about the best.

4. *Fright and passion* are often a cause. Bromides and chloral for several hours to soothe and lessen the tendency.

5. *Foreign bodies* in the nose, ears, and other passages. This is a very common cause, as children have an inveterate habit of stuffing pieces of stick, beans, bugs, and all sorts of things into these parts. The convulsion in this case is often as much due to fright as to irriration. Thorough and careful examination, as in all other ailments in children, is the only method of discovering the cause.

6. *Pain.*—Opium in the form of solution of morphine. It is preferable to give it in this way, because it is more readily absorbed, whereas in other forms, especially in powder, two or three doses may lie in the stomach and then be all suddenly taken into the system, poisoning the patient.

7. *Uræmia*, etc., from retention of the urine caused by contracted prepuce, stone in the bladder, etc., or from acute kidney disease. In retention draw off urine with catheter ; for this purpose the children's catheter invented by Dr. Ripley, of New York, is the best. In case of kidney disease, promote action through the skin by vapor bath, and hypodermic of 1/6 gr. pilocarpine, more or less according to age.

8. *Insolation* (sun stroke).—Ice pack to the head, and every means to reduce temperature.

9. *Meningitis*,—The only hope of saving the child with this affection is to recognise it early. The commencement is slow and generally marked by a greater variety of symptoms than any other disease.

In order to arrive at a correct diagnosis, we find it necessary to make frequent visits and careful examinations, as, once the convulsions have appeared, the prognosis is very unfavorable. In the majority of instances our diagnosis is one of exclusion. The general restlessness and irritability of temper, the vomiting and constipation are the most constant symptoms ; but no two cases are alike in the early stages. Bromide and iodide of potash in large doses. Bathe the feet in hot water and mustard ; 1 to 2 drms. to 2 qts. water, at night or through the day as it very often has a soothing effect. In the stage of inflammation our object is to keep it down as much as possible, by applying cold to the head and a blister of cantharidial collodion behind each ear ; if the bromide is not sufficient to quiet restlessness, give chloral. The constipation is easily removed by purgatives. The strength must be kept up by nutritious diet.

10. *Cerebro-spinal Fever* is to be distinguished from other forms of meningitis by its sudden onset. The attack usually comes on between midday and midnight. The child goes to school in the morning all right, and comes home in the afternoon with headache, vomiting, high fever, convulsions, followed by stupor. The only disease likely to be confounded with it is scarlet fever. This can be distinguished by examination of the fauces, which will be red and inflamed in the commencement of scarlet fever. Ice bags to the head and nucha are required as long as no chilliness is complained of. Occasional hot mustard baths to feet. Pot. brom. internally ; also ergot may be given. The strength must be kept up. When hyperæmia is reduced alcoholic stimulants may be given.

11. *Anæmia of the brain*, as the result of exhausting diarrhœa. Give stimulants. The quickest is a hypodermic of ether ; afterwards, for the poor, malt

whiskey—which is usually purest—for the rich, champagne.

12. *Congestion of brain.*—Apply a sinapism to nape of neck; mustard bath to feet and limbs and purge smartly.

13. *Cranio-tabes.*—This condition, which is only found in rachitic children, is, we think, almost the only cause of laryngismus stridulus or internal convulsions. Any pressure on the brain through the softened portions of the cranial bones causes the spasm. The same treatment should be pursued during the spasm as recommended above for congestion of the brain, as the principal danger is from cerebral congestion. Then treat for rachitis. It is because rachitis is always associated with this disease that we find the line of treatment advised—change of air, nutritious diet, cod liver oil, etc., to be of such benefit.

14. *Pneumonia at the apex* often has, as a symptom in children, convulsions. You will be able to recognize it by the physical signs.

Catarrhal pneumonitis, which is usually preceded by bronchitis, and occurring oftener under the age of three years, requires stimulating treatment. Am. carb. and stimulants. An opiate, as compound tinct. of ipecac, may be added to the cough mixture, if child is restless. Tonics and nutritious diet, with frequent change of position to avoid hypostasis.

Croupous pneumonitis, with which, in the present instance, we have more to do, comes on suddenly, not gradually as catarrhal. The onset usually being with a cold or chill in the adult, gives place to convulsions in the child. If seen at first or within a few hours, give an emetic of ipecac (Trousseau): it is not of any use after the disease has thoroughly set in. Give aconite as a cardiac sedative, with tonics and nutritious diet.

15. *Pressure on the brain*, from chronic hydrocephalus, tubercular tumors, or syphilitic gumma. Our space is not sufficient to take these up, and they need merely be mentioned to be guarded against: (*a*) hydrocephalus, with its round enlargement of the head; (*b*) tubercular tumors, the strumous appearance and enlarged cervical glands, with the history; (*c*) syphilitic gumma, the enlarged epitrochlear glands and history. In the last we have a specific in pot. iodide.

We have not taken up the many instances where convulsions occur—as above mentioned—in place of chill, at the outset, and delirium during the course of the different contagious fevers, as in these instances the convulsions are purely symptomatic, and do not particularly affect the course of the disease. But in the case of meningitis, cerebro-spinal fever, and pneumonitis, where the final success of the treatment depends on the recognition of the nature of the malady in its first stages, we have given as many data as possible in such small space.

W. B. N.

NEUROLOGY.

What is Nerve Force.

(From an address by Prof. H. P. Bowditch, Boston.)

"Of all the functions of the nervous system, the one which at first sight would seem most accessible to investigation, is that of nerve fibre itself. . . . With the discoveries of Du Bois Raymond, the hope arose that nerve activity might be explained as an electrical phenomenon. . . . The important facts which forbid the identification of nerve force with electricity are the absence of an insulating sheath on the nerve fibre, the slow rate at which the nerve force is transmitted, and the effect of a ligature on a nerve in preventing the passage of nerve force while not interfering with that of electricity . . . In studying the nature of nerve force two alternatives present themselves. We may conceive the impulse to be conducted through the nerve fibre by a series of retrograde chemical changes in the successive molecules of nerve substance, the change occurring in one portion of the fibre acting to produce a similar change in the neighboring portion. . . . This theory may be called *the discharging hypothesis*. . . . On the other hand, we may conceive that the nerve force is transmitted from molecule to molecule by some sort of vibratory action, as sound is transmitted through a stretched wire. . . . This may be called *the kinetic (motion) theory*."

With the *discharging hypothesis* we would necessarily have associated production of heat and evidence of chemical change, and gradual diminution of energy on continuance of the stimulation; while with the kinetic theory we would expect absence of all of the moving particles which are endowed with elasticity. What are the results of experiment with regard to each of these?

(a) Chemical changes in nerves.—The only evidence adduced of this has been the statement by Funke and others, that the normal alkaline condi-

tion of nerve tissue becomes like that of muscle, neutral or acid during its activity; but regarding this and any other asserted chemical changes in nerves Bowditch says, "It is therefore clear that chemical investigation gives us but little reason for maintaining a discharging in opposition to a kinetic theory of nerve action.

(b) Heat production.—After summarizing the evidence, Bowditch says, regarding this point, "It seems then that the results of thermometric investigations speak no more positively than those of chemical research in favour of a discharging rather than a kinetic theory of nerve action."

(c) Nerve fatigue.—After reviewing the results of several unsatisfactory experimental methods, the writer refers to those of Bernstein on muscular contractions as indices of effects on nerves. He came to the conclusion that a nerve may be exhausted by 5'–15' tetanic stimulation. Wedenskii, with improvements on Bernstein's method, "was unable to find any evidence of the exhaustion of the nerve even after tetanic stimulation had continued six hours." To further determine this point experiments were carried out at the Harvard Medical School, in which muscular contraction was temporarily prevented by *curare*. "In this way it was found that stimulation of the nerve lasting from one and a-half to four hours did not exhaust the nerve since on the elimination of curare the muscle began to contract." It thus appears that evidence of fatigue in nerves resulting from functional activity has not been proved.

"It is conceivable that the irritability of a nerve should depend upon its possessing a certain definite chemical composition constantly maintained by metabolic changes, and yet that the irritation of the nerve should produce no change whatever in its composition." All evidence so far on this "most mysterious and interesting process" is in favor of a kinetic as opposed to a discharging theory of nerve action.

OPHTHALMOLOGY.

Notes from Foreign Journals.

M. Beaunis has observed various atrophic lesions of the globe of the eye of a rabbit which had suffered a lesion of the facial nerve. He presented the animal having the lesions to the *Société de Biologie* and has likewise proved similar lesions in the ear; the secretion of tears is similarly altered. *M. Laborde* is said to have observed a similar commencing atrophy in the eye of a rabbit following a simple section of the facial nerve. *Brown-Sequard* relates similar facts. According to him these troubles are due to irritations of the bulb due to traumatism.—*Gazette Hebdomadaire.*

Deutschmann (Jena) has found not only small caseous tubercles in the inferior portion of the iris, but also numerous white *taches* (spots) composed of a mass of round cells without any traces of bacilli. These same spots in the iris are similarly found after inoculation of leprous matter into the anterior chambers.—*Revue Générale D'Ophthalmologie.*

Fieuzal performed, during 1886, 459 operations for cataract, 320 without iridectomy and 139 with. The results without iridectomy were 238 (74%) good; 72 (22%) fair, and 10 (3%) no results. With iridectomy the results were 109 (78%) good; 25 (18%) fair, and 5 (3%) no results.

PHYSIOLOGY AND BIOLOGY.

Atavism.

Mr. J. Bland Sutton, in proceedings of the Zoological Society, London, by means of the classification of Prof. Gegenbaur, endeavors to show that all examples of atavism are palæogenetic and that none are neogenetic, or not found as a germ in the embryo; the prostate is supposed to furnish a remarkable instance of atavism, being regarded by the author as a supressed uterus, the fibro-muscular tissue representing the matricial walls, the follicles corresponding to reticular glands and the reticulus itself being identified with the cervix uteri and adjacent portions of the vagina.

The prostatic concretions and eggshells, according to this gentleman also, agree structurally and chemically and are produced by homologous organs so that we appear to have in our prostate an unimpeachable witness of an ancestry with the feathered tribes low down among the oviparous reptiles. Dealing with secondary sexual characters, the author urges that the known facts seem to point to the conclusion that the epiblast is chiefly derived from the male element while the female pronucleus is chiefly responsible for the hypoblast and greater portion of the mesoblast; if this be true the transmission of characters peculiar to the male is not so obscure as many have supposed.

The Different Tissues Found in Mummy Muscle

Dr. R. T. Maddox in a paper before the Royal Microscopical Society gave results of an examination of a piece of muscle taken from the triceps of a female mummy. He wished to see if in a piece of organic tissue so long preserved, there would be any distinction of histological elements such as appear in fresh muscle and especially if the striae characteristic of voluntary muscle could be recognized.

Macroscopically, the piece of muscle examined, looked like a piece from an old cocoanut fibre door-mat or a piece of spent tan. Separate portions of the muscle were treated with various reagents. Those which possessed most advantage were:—

No. 1 Glycerine 4 dr., glacial acetic acid 4 m.

No. 5 Glycerine 4 drs., glacial acetic acid 4m. chloride of zinc 6 gr.

No. 8 Distilled water 3 parts, hydrochloric acid 1 pt.

No. 9 Distilled water 6 parts, nitric acid 1 pt.

No. 16 Boiled a piece for ten seconds in equal parts of distilled water and rectified spirit, then allowed to soak for three or four days.

No 1 permitted dissection of the fibres into smaller bundles but not into fibrillæ.

No. 5 allowed separation into fibrillæ and also brought into view a blood vessel filled with rather coarse granular contents.

Nos. 8 and 9 allowed compression of the fibres until they presented a fine granular appearance in which could be seen fibres of different refractive power, which, under a "high power" could be traced into different planes forming a plexus.

No. 16 allowed the above examination to be carried perhaps a little further. The muscular fibres and fibrillæ were preserved, but minus their striations. The blood vessel with granular contents was easily made out, but whether the contents were due to blood changed by the process of embalming, or the injection of some preservative fluid could not be told.

The fine fibres of different refractive power were traced in the form of a plexus through different levels and were considered to be nerves. Although no striæ were observed in the muscular fibres, yet some of the fibrillæ appeared to be made up of a chain of dots, but how far this was due to original structure or to the general coagulation in the highly compressed and softened muscle could not be stated.

The author of the paper was not aware at the time that any work had previously been done in this direction, but discussion showed that Czermak in 1852 had examined various histological elements taken from mummies with the following results:

These numbers refer to the figures in the plates of Czermak's article, and sufficiently serve to illustrate his results: 1 The cells with nuclei of a section of the nail of the ring finger of a female mummy. 2 A longitudiual section near the root of the nail. 3 Hair from the head of the female, showing the sheath. 4 A cross section of the hair near the root. 5 The cells of the inner sheath. 6 Henley's and Huxley's layers. 7 A transverse section of the *flexor pollicis longus* treated with water. 8 The cartilage cells of the ear. 9 Section of the cartilage of the patella, with the cells in situ. 10 Cartilage cells from the rib of female mummy. 11 Nerve fibres of the median nerve, in which besides the nerve substance, the axis cylinder can also be seen. 12 A few muscular fibres from the sphincter of the eyelid, as seen in turpentine, showing the striation and other appearances. 13 A section of the fatty layer in the great toe of the adult mummy, with the fat cells in position.

BACTERIOLOGY AND EPIDEMIOLOGY.

Preventive Vaccination of Anthrax —(*Translated.*)

[This, the most recent resumption of the discussion by Pasteur's German critics, on the practical value of preventive inoculations for anthrax or charbon, has a special value inasmuch as we know, that inoculation experiments carried on with blood from victims of the suspected anthrax near Guelph, have showed it to be without doubt anthrax, and hence calls for the serious consideration of local preventive inoculation methods.—Ed.]

The *Deutsche Med. Wochenschrift* of 8th Sept. resumes the criticism of Pasteur's methods of inoculation against charbon. It contains an exact account of the protective inoculations made in different countries by Chamberland, of Paris, Lydtin, of Carlsruhe, Pütz, of Halle, Custer, of Zurich, and Csokor, of Vienna. . . . Koch has maintained that, in practice, the method of preventive vaccination of charbon has no value. Here are the facts on which he bases his assertions:

1st. 31 cattle were vaccinated at Gorsleben. Three died in the following year or ten per cent. The vaccinations were not continued, and fol-

lowing this two or three died each year, i.e., as many as during the year in which the inoculations were practiced. These same facts are related of experiments at Cannawurf.

2nd. In 1886, at Kelbra, out of one hundred and forty animals sixty-four were vaccinated; seventy-six were not. Each had a death from charbon.

3rd. In 1882, the veterinary department at Œmler, vaccinated during five years eighty cattle and three hundred and sixty sheep. Charbon caused among the cattle 4.2 per cent. of victims and 1½ per cent. amongst the sheep. The malady attacked re-vaccinated animals. During the two latter years there were one hundred sheep inoculated and one hundred not, all the conditions being equal, and were placed on the suspected pastures. The vaccinated beasts died of charbon and in the second year two others not vaccinated. In order to believe in the efficacy of the method Koch would demand from Pasteur the guarantee of the correctness of the French statistics. Pasteur states that, health permitting, he will furnish at the coming congress at Vienna, but if not Mr. Chamberland will defend and maintain the conclusions arrived at in the report. All that is admitted in Germany is that the method of preventive inoculation produces only a conditional immunity against communication of the disease a very small result from the practical standpoint.

Mr. Chamberland's report first relates experiments made outside France, in Austria, Germany, Italy, Belgium and England, and according to the journal, does not deduce any facts favorable to his hypothesis, supported as it is almost wholly on the facts of French practice. He considers it to be a demonstration of the procedure, that the number of the vaccinated in France has continued to increase from year to year. Since 1882 it has greatly extended. The laboratory requires of veterinarians minute and detailed reports.

In 1886, there were 202,064 sheep, and 22,113 cattle vaccinated, in which the estimated mortality, according to the report—from vaccination and from charbon—was one per cent. in the sheep and one-and-a-half per cent. in the cattle, while according to the veterinarians, the proportions before the vaccination was practised was ten per cent. and five per cent. respectively. Thus as Chamberland says he cannot doubt that immunity does not tend to disappear, but that it continues for most animals at least one year. It is indeed certain that it continues longer, and to avoid accidents, we think it advisable and useful to repeat the vaccination every year.

In the report of M. Lydtin, of Carlsruhe, its force is considerably broken by authentic documentary evidence of M. Koch. In spite of favorable results, Lydtin comes to the conclusion that Pasteur's method confers only a relative and conditioned protection. This opinion is confirmed by Koch, Gaffky, Œmler and Kill. They have shown that a relatively frequent vaccination prevents during a certain time; but as to the practical value of the operation the writer is of the opinion of the commissioners of Parkisch. From an economic point of view says this commission preventive vaccination is to be recommended for large farms where endemic charbon causes great losses. It is especially for the bovine species that the inoculations are advantageous because these animals withstand inoculations better, and they are worth more to the farmer. There is room for hope that the method will perfect itself and that the loss caused by inoculation of sheep will in the future become considerably less. In order to arrive at a definite opinion on the value of preventive vaccinations, says M. Lydtin, an International Commission ought to be appointed which might condense the results of different experiments.

M. Custer's report gives Dr. Hesse's experiences in Switzerland. The results are most favorable. He thinks vaccination against charbon in sheep has a future as important as that now assured for it in cattle.

M. Csokor, of Vienna, treats on the theoretical question and in summing up states that Pasteur's opponents have never questioned the scientific value of the discovery, but on the contrary they have confirmed the experimental procedure (Koch, Gaffky, Lœffler) and that it is only on its practical value, and the opportunities for its employment that opinions diverge.

Summing up, all the reports with the exception of Chamberland's and Custer's, agree as to this small amount of value attached to the Pasteur method. On the other hand, it is certain that in France, from 1881 to 1886, 260,000 sheep and 29,000 cattle have been inoculated.

Thus the conclusion arrived at by this Ger-

man journal is that the Pasteur method has yet need for demonstration as to its utility.

On the whole, however, the facts presented apart from bias are undoubtedly in favor of the method. They show (1) perfect agreement on the scientific value of the method; (2) practical and economic advantages of the method as practiced amongst cattle.

The Theory of Immunity from Contagious Diseases

For many years this vexed question has been discussed, and although Pasteur and Davaine have given to it the attention of the highest scientific attainment, still there is much yet undetermined. Acquired immunity has as usually given three explanations: *(a)* a substance is formed in the body during the disease unfavorable to the multiplication of microbes; *(b)* a substance favorable to the growth of these microbes is exhausted during the disease: or *(c)* the living matter of the body might acquire the power to resist or prevent the growth of microbes.

Pasteur gives reasons for belief in the second, or *exhaustion* theory, and supports it by the fact that a culture after evaporation *in vacuo* without heat and then being brought back to its original volume with fresh culture fluid will cause the microbe to grow again, whereas, had some new poisonus principle been evolved, the new culture should have proved sterile.

A difficulty which appears at the outset in the exhaustion theory is that the body, by a process of assimilation and exertion, not only must make new materials similar to those previously used up, but also throws off very soon what might prove injurious. Prof. D. E. Salmon, Agricultural Department, Washington, who has spent a number of years investigating this, among other subjects, has further pointed out that, if a *bouillon* be made of the muscles of a fowl made insusceptible to cholera by moculations and sterilized, the microbe of chicken cholera will multiply in it just as readily as in a *bouillon* made from a susceptible fowl.

Thus it appears that both the exhaustion and antidotal theories fail to explain immunity, and Salmon reverts to the third or *vital resistance* theory. He says, "Immunity is probably never absolute, but simply relative." This seems to have been proved in many ways; amongst others, by the fact that in vaccine stables operators have been known to have vaccine vesicles two or three times in a couple of years, at points of abrasion on the hands or arms. Chauveau, Salmon, etc., have proved that sheep, fowls, insusceptible to ordinary *doses* of virus have succumbed to sufficiently increased doses. Salmon says that such facts "indicate that the tissues of the most susceptible individuals are not suited to the growth of microbes when the functions of the cells are normally performed; because, if favorable, one germ introduced into the interior of the body would multiply just as it does in a culture flask, and finally would produce the disease with the same certainty as would a million. This not being the case, it is evident that by increasing the dose the resistance of the tissues is in some way overcome and the disease is produced." That it is vital activity which resists seems evident from the fact that the bacteria of putrefaction will not multiply in the body during its life, but immediately after the death thereof. But how, in any case, is the vital resistance of cells overcome? Salmon has suggested that the cells have a normal activity, they keep oxygen so completely removed from blood that microbes requiring it cannot live. Metschnikoff thinks a struggle goes on between bacteria and wandering cells (phagocytes). According to Salmon, Zuelzyer and Riemshneider, have found that microbes introduced into the blood may produce no effects, but, if after their introduction a few minims of atropia be injected a septicæmia will ensue. Thus a narcotic opens the way for further multiplication. Other extended experiments by Chauveau, Hiller, etc., all go to show that the poisonous principles (ptomaines) elaborated in cultures by microbes, while not by themselves producing poisonous effects, will, if injected along with microbes, allow the latter to multiply. Salmon's most recent investigations at the Bureau of Animal Industry, into the nature of swine plague have proved that the microbes of the disease elaborate in their multiplication a poisonous principle which, when tested with on the circulation of small animals, produced effects almost identical with those caused by atropia.

Summing up, Salmon says, "We can readily understand how a relatively large dose of virus overwhelms the animal cells at the point of its introduction with its peculiar poison, arrests their activity, prevents them from withdrawing the oxygen, at least to the normal degree, from the liquids

surrounding them, and in this way overcomes those conditions which are unfavorable to the growth of microbes." Various additional arguments are added, and we are led to conclude that the vital resistance after an attack of the disease overcomes the disease by the tolerance of the system to their presence, and that the original immunity of the system to that particular disease is resumed. [We think it much more probable, however, that at this stage, after the presence of numerous microbes in blood for a time, the destruction, along with the vital force of cells left is due both to the *exhaustion* of nutriment and the presence of ptomaines in excessive amounts, just as an animal may be self-destructive by carbonic acid eliminated by it.—ED.]

OPENING OF MEDICAL SCHOOLS

Toronto University Medical Faculty

R Ramsay Wright, M.A., Prof. of General Biology and Physiology, delivered the opening address. After thanking the Vice-Chancellor and other authorities for selecting him to deliver the inaugural address of the new Faculty, Prof. Wright said that in calling attention to some phases of the evolution of medical education it is necessary to look back some eight centuries to the mediæval universities.

"These seats of learning were at first but few in number, and owed their origin for the most part to some cathedral or monastic school which had afforded instruction to the youth of the neighborhood in the elements of grammar, logic and rhetoric. At first these centres confined themselves to their specialties, and only in later times did they offer instruction in all the branches of learning.

"Having been attracted to such centres by the fame of their masters, the scholars remained to teach, being almost obliged to do so in order to meet the wants of the constantly increasing numbers of students. This rapid growth in the number of students is one of the most striking characteristics of these early universities —as many as 30,000 scholars, it is stated, were in Oxford six hundred years ago."

"I have said sufficient to show that the prime function of the university in these days was teaching, by masters who professed special branches of learning, while the chief educational value of the colleges consisted of the life in common, under certain domestic restrictions, and in the intellectual fellowship to be had within them.

"After this glance at the nature of the mediæval universities, let me now proceed to show, a matter of special interest to us to-day, how the earliest of all originated in a school of Medicine—the famous school of Salerno, near Naples."

After a concise and comprehensive account of the fostering care and protection afforded to the art of medicine, which had been handed down through the families of Æsculapius, by the monastic institutions, its progress under the Arabs, and the schools of Salerno, Bologna, and Paris, Prof. Wright referred to the growth of medical education in Great Britain. Referring to recent progress, he said, "There has been a very remarkable activity in the pursuit of the sciences in Oxford and Cambridge, accompanied by an effort to regain that share in medical education which had almost entirely drifted from them. The movement has already met with conspicuous success in Cambridge, where the graduates in Medicine are ten times as numerous as they were ten years ago.

"It is, however, in the Scottish and Continental Universities that we realize to what importance the Medical Faculty may attain. Edinburgh has nearly three times as many graduates in Medicine as she has in arts in each year, and while the latter contribute some $2,500 in the form of graduation fees to the university chest, the graduation fees of the former amount to between $30,000 and $35,000 annually.

Again, in the Prussian Universities, more than half of the degrees annually conferred are in the Medical Faculty, and this in spite of the fact that a degree in Germany does not now carry a license to practise. It must be understood, however, that although such is the case, the State examination for license is conducted by university professors, and medical education can only be obtained at the universities."

Referring to provincial university education, Prof. Wright said, "The University of Toronto was.

modelled after the London institution, having, however, the advantage over its prototype of including in its senate representative teachers who secured for the Arts Faculty at least the closest harmony between the teaching and the examinations. The result of that harmony is to be seen in the constantly increasing number of graduates in Arts during the last thirty years. But no such close connection has hitherto existed between the university and the instruction in Medicine with a result which, tested in the same way, is just as deplorable as the other is gratifying. It is to remedy this defect in our organization that the step has been taken which we inaugurate to-day,

"I have spoken hitherto chiefly of the university as a place for the education of its undergraduates, but we have seen that it has a higher function than that—the advancement as well as the diffusion of learning.

"How are we to account for the fact that the German Universities have been able hitherto to keep this higher function steadily before them, and have thus secured their present acknowledged supremacy in the domain of the physical and biological sciences? It is the result of money spent liberally by the Government with that object. The Government contributes 72 per cent. of the annual cost of the universities, 44 per cent. of which is devoted to the equipment and maintenance of institutes which serve for investigation as well as for teaching in the various sciences.

"The German Universities are, further, peculiar in the large number of young teachers—the *privat-docenten*—who, in their relation to the university, recall the fact that every doctorship was at first a permission to teach. Many of these *privat-docenten* have now assistantships, and it would be well if we had a series of assistantships in our medical faculty similar to the fellowships in University College. Young men who have succeeded in obtaining a university degree and a license to practice, are usually bent on at once testing their qualifications for success, and, indeed, are often obliged to do so."

Regarding the methods of instruction in connection with the new school, the lecturer said, "Although we should like to see a system of fellowships for the encouragement of post-graduate studies in Medicine, yet the practice has been discontinued giving awards in the shape of scholarships and medals for distinction at the annual examinations. It has been thought that these stimulate a particular sort of preparation—cramming—which is especially undesirable in professional training. The four years of medical study are so short, and the burden of knowledge to be acquired so heavy, that the greatest judiciousness is required on the part of the teachers to ensure that the necessary training of the senses and judgment shall accompany the mere memorizing of facts. Facts are easily lost if not bound together by principles, and consequently it will be our aim to send out our students not only well equipped for practice, but with a clear conception of the main principles of the medical sciences."

Addressing the undergraduates Prof. Wright said, in conclusion, "As matriculated students of the University you have undertaken certain responsibilities. I told you that the word *university* referred primarily to the community of interest of the members of a sort of literary republic. Remember, then, that the reputation of the University and of our new Medical Faculty depends not only on the masters but also on the scholars. It is our intention to do everything in our power towards giving you a thorough and practical education in the science and practice of Medicine. Let it be your care to profit to the utmost by your opportunities, and thus do credit to the institution which you will be justified in speaking of from to-day as your Alma Mater."

Western University Medical Faculty.

The opening lecture of the sixth session of the Western University was delivered by Dr. Moorhouse, on Monday, Oct. 3rd, a large attendance of students and others being present. The chair was occupied by Dr. Arnott, and there were also seated on the platform Drs. Moorhouse, Waugh, Fenwick and Mr. Jas. H. Bowman.

The chairman said the audience would be pleased to know that the University was doing excellent work. After briefly reviewing the marvellous advancement made in medical education during the nineteenth century and impressing the necessity of looking to individual health, he called upon Dr. Moorhouse to deliver the opening lecture of the present session.

The opening of each session of the Medical Department of the Western University has been marked by lectures of great value, said the lecturer,

both to the medical student and the ordinary hearer. The field has been very thoroughly covered and he thought he could not find a more fitting or appropriate theme than a short history of the rise and progress of Medicine. In all newly discovered countries, no matter how barbarous, we are sure to find some rude appliances both in medical and surgical practice. The idea that disease is caused by the anger of superior and invisible beings naturally placed its treatment in the hands of the priest.

The lecturer revealed in a comprehensive way the status of Medicine amongst the Egyptians, Jews and Greeks, and especially referred to the comprehensive teachings of Hippocrates.

The first hospital was founded toward the end of the fourteenth century at Carsarca by St. Paula, and owed its inception to the influence of Christianity. From the eighth to the twelfth centuries the Saracenic schools of Medicine flourished, and their peculiar mode of treatment was ably set forth.

The lecturer further referred to the achievements of Roger Bacon, Gaspard Aselli Milan, and other men of the *renàissance*, and said that during the present century preventive medicine or sanitary science has made great advancement. In considering the latter the lecturer said he was pleased to know that the Board of Health had taken such important and opportune steps to ensure the purity of the city's milk supply. He thought milk conveyed more virulent types of disease than any other cause. In closing, Dr. Moorhouse quoted the words of one of England's greatest statesmen, who considered that Medicine during the present century had made a great advance in the field of science, and if it continued at its present rate of progress at the close of the century it will have far outstripped all other branches of science.

The doctor was tendered a hearty vote of thanks for his able and eloquent *resumé* of the history of medicine, and the chairman expressed the hope that the students would be benefitted correspondingly with the amount of labor requisite in its preparation.

Trinity Medical School.

The opening lecture of Trinity Medical School was delivered on Monday, October 3rd, by Professor Davison. In forcible language he gave the students advice regarding their college career. He condemned the practice of cramming for examinations, and showed how much higher ends could be accomplished by steady work and perseverence in gaining a clinical knowledge of Medicine from the very start to the end of the medical curriculum. He dwelt upon the fact of how much greater the opportunity was of achieving high attainments now than in days gone by for men who would work to obtain knowledge of the science of medicine in preference to a purely mercenary motive. Our Hospital and our Burnside Hospital admitted three times the number of patients now that they did ten years ago. He upheld in eloquent terms the medical student, and expressed his opinion, formed after fifteen years' intimacy with various classes, that the medical student was as a rule a harder working and more self-denying man than the student in almost any other sphere of work, and attributed the oft expressed opinion to the contrary to ignorance on the part of the laity. He concluded by stating that the work of every medical man was necessarily one of charity, and as charity covered a multitude of sins, he could only suppose that as so much of it fell to the lot of every medical man he must have more than the average number of sins to cover.

Prof. Goldwin Smith and the Provost of Trinity College were called upon and made brief replies.

Royal College, Kingston.

The Kingston Medical School began the session of 1887-88 by an address from Dr. Dupuis, Prof. of Surgery. He briefly alluded to the rise of the school and the valuable work done in preparing men for the supply of the country's need. He referred to the founders of this school, and spoke a few memorial words to those who had passed away from it for ever. He recounted the important changes made in the hospital, and ranked it as second to none of its size in the country. He attached the greatest importance to the study of anatomy, and showed how all other branches of study depended directly or indirectly upon it. After hastily noticing the departments of physiology, pathology, therapeutics and materia medica, he suggested that a study of bacteriology was necessary for the full accomplishment of the doctor of the present day. He closed his address with appropriate words of advice to the students.

Women's Medical College.

As on former occasions, the opening lecture of the new and promising Women's Medical College was delivered in the theatre of the Normal School. The chair was ably filled by Mr. Jas. Beaty, Q.C., in the absence of the Minister of Education. Besides the members of the Faculty, there were present Principal Caven, Prof. Goldwin Smith, Dr. Kellogg, and a large number of ladies and gentlemen.

The chairman, in introducing the lecturer, referred to the work the college was effecting. A larger number of students than ever before would be in attendance during the present session. Through the liberality of the friends of the college $2,300 had been collected for its purposes, and the prejudices existing in people's minds against medical education for women were being rapidly removed.

The Dean of the College, Dr. McPhedran delivered the opening lecture. The late Dr. Barrett was referred to as one who had done much for the college, and whose loss was deeply regretted by every one. If the college was to do the work which lay before it in an efficient manner, a considerable amount of funds should be forthcoming, and to supply this the college looked to its friends in the city. The staff had so far received nothing for their services, and their work was a labour of love. The pursuit of Medicine in itself seldom led to wealth, and as the profession existed purely for the welfare of the public, that public should supply the needed education.

Prof. Goldwin Smith, Rev. Dr. Kellogg, Drs. Workman and Covernton also made some pertinent remarks.

Dr. Krauss moved a vote of thanks to the Minister of Education, and suggested that he should use his influence with the Government to place a house surgeonship in the Mercer Reformatory at the disposal of the college as an efficient recognition of its work and a stimulus to the students themselves.

The motion was carried and the proceedings terminated.

MEETINGS OF SOCIETIES

Toronto Medical Society.

STATED MEETINGS, *Sept. 24th, 1887,*

The President, Dr. Nevitt in the chair.

Pathological Specimens.—Dr. Temple presented a multilocular cystic tumor. The diagnosis had been somewhat obscure. The history of the case dated back only to last March, and it was not even suspected by those who examined the case then that the growth was abdominal. No perceptible fluctuation through the vagina, the main part of the tumor lying in rear of the fundus uteri. Both ovaries involved, also fimbricated extremities.

Oct. 8th., 1887.

The President, Dr. Nevitt, directed the attention of the society to a case he had present. A woman *æt forty-five*, who received a large scalp wound twenty-nine years ago. It had never healed perfectly though no dead bone had ever been seen. Latterly the open wound had become larger and there were nodular swellings behind the ear.

Dr. Reeve made a few remarks on the new local anæsthetic, stenocarpine. He believed it more useful than either atropine or cocaine in certain cases. A 2 per cent. solution produces mydriasis. It completely paralysed accommodation. It also diminished tension in the eye-ball and hence useful in iritis. Cocaine is more useful in operations where mydriasis is not required. Its toxic effects resemble strychnine. It will not anæsthetize the skin.

Dr. Atherton read a short paper on a case of probable fracture of the larnyx as a result of a blow under the chin. Rapid emphysema of the neck, chest, and upper portion of the body followed upon the injury with urgent dyspnœa. Tracheotomy gave relief.

Dr. Graham presented notes of four cases of a peculiar skin disease of a discrete vesicular or bullous type—a dermatitis herpetiformis.

October 13th, 1887.

Cases in Practice.—Dr. G. B. Smith shewed a case of ununited fracture of both bones of the leg. The accident had occurred when the boy was 6 weeks old. Now he is 3 years old. The leg is 3 inches shorter than the sound one, and the bones much

smaller. With coaptation splints the boy manages to get around a good deal.

Pathological Specimens.—From a patient who had been subject to epileptoid fits for many years. The last attack was followed by grumous vomiting, great pain, with tympanitis and death in two days.

Dr. McPhedran, who reported this interesting case, believed death to have resulted from bowel trouble.

Oct. 20th., 1887.

The President, Dr. Nevitt, read a very interesting paper on several complicated cases of labour in his own practice, referring to short cord, unusual presentations, peculiarity in pains, administering of anæsthetics, with applying of instruments, etc.

This paper evoked considerable discussion; Dr. Carson leading off by saying he thought it impossible to diagnose a short cord previous to the rupture of the membranes, and advised when instruments were deemed necessary, medical assistance should be obtained.

Dr. Atherton said his practice had been to give the anæsthetic and apply the instruments alone. He accounted for occipito-posterior position from mal-position of the placental site or a faulty-formed pelvis, the child naturally settling down when labor begins, in the most comfortable position. As a means of controlling a relaxed uterus, he used a bowl or saucer containing a folded napkin applied to fundus with the concave surface downwards.

Dr. Ferguson advocated help in every case of instruments excepting when it was one of a purely slow labor.

Dr. Graham thought that early death of infant might be owing to traction of abdominal organs of child owing to short cord.

STATE MEDICINE

OUTBREAKS IN FOREIGN COUNTRIES.

Scarlatina in London.

This disease has in recent years shown in Great Britain, so noteble a decrease in prevalence and in mortality that it had in some ways ceased to create the same terror as in former times. This same notable decrease has been seen in Ontario. For instance there were, in 1871, 630 deaths, while, in 1885, there were only 314 returned. English, and notably London, experience at present shews that there is the same tendency as ever for it to recur, whenever a new susceptible generation of children is exposed to its ravages. So far, although there have been at one time 1,500 cases in the London fever hospitals, the epidemic has not approached, judging from the mortality returns, the extended proportions of previous epidemics. Still its extent, in some instances, is enormous; the city of Dundee, Scotland (138,000) pop., having had reported in August 658 cases and 28 deaths.

Smallpox in South America.

This disease is raging in Rio Janeiro and Buenos Ayres, there having been in Rio (300,000 pop.) over 500 deaths in August, and a similar prevalence, judging from the June report (226 deaths), in Buenos Ayres. The commercial intercourse between these ports and New Orleans, New York and Lower Province ports makes this disease, as seen in the recent case of the *Aeronaut* at Montreal, a constant menace to the public health of this continent.

Typhus in Newcastle-on-Tyne.

The Medical Health Officer has just issued his report regarding its outbreak, and states that had there not been compulsory notification it would have been raging. Its virulence is illustrated by a case where, the patient having refused to go to the hospital, two bakers supplying bread to the house took the disease, one dying.

Cholera in Italy.

The continued prevalence of this disease there may be judged from the fact that Palermo (250,000 pop.) had 47 deaths during the week ending Sept. 11th and 35 Sept. 18th. The *Alesia* has well illustrated the danger of its introduction to America. Still during the coming months we have much more to fear from British scarlatina and South American smallpox.

La Suette Miliare in France—(translated).

Brouardel has just given to the Académie de Médicine (Paris) the report of a commission ap-

pointed to investigate an outbreak, in 1887, of what is called the "sweating sickness" in Poitou. Its unusual appearance will make a word of description of interest. In its first period we have sweats, fever, general weakness and nervous depression, cough and epistaxis: second period an eruption appears on the fourth day after onset, vomiting and itching; eruption is miliary, acuminated, vesicular, with exfoliation in its evolution. The exanthem may be rubeolous, scarlatiniform or hæmorrhagic. In this stage the skin sweats less and fever falls. third period—desquamation, in points or in large scales, and even large patches. Convalescence varies in its length; frequently extended by anæmia. A disease generally mild, it may yet become extremely malignant, death occurring within forty-eight hours of the onset. Its clinical relationships, according to Brouardel, are that it appears where measles has recently prevailed, and is likely to affect the same children. In one house may be seen parents with all the pronounced symptoms of the classical disease, while the children have it in a milder form. The epidemic of 1887 began in a *commune* of Lussac, thence imported to Poitiers. It seems to have been in some degree epidemic in the district in 1878-80-85. It is very fatal to adults; 33%-50% of those attacked die, and is eminently contagious. Its inoculation may be twenty-four hours, and it is spread much as measles and scarlatina. The Sanitary Commission undertook first, to disinfect the centres of infection, and, second, to prevent its spreading; or, as Brouardel says, "Guard narrowly the periphery and stamp out the disease in the centre where it appears."

OUTBREAKS IN THE UNITED STATES.

Cholera at New York.

Cholera has claimed in all some 16 victims from amongst the passengers on the steamer *Alesia*. At last accounts most of those attacked were convalescing at the station, and the passengers were set free from quarantine. The quarantine officer's report shows that every method for disinfection has been put into effect.

Yellow Fever at Key West and Tampa, Fla.

The vague reports from these places, notably the latter, are not reassuring to the people of the Gulf ports and the Mississippi. The low mortality in several outbreaks gives an opportunity for the denial of the existing disease being yellow fever. The President of the Louisiana State Board, who is chief quarantine officer of New Orleans, insists, however, that the only condition of safety is in calling suspicious outbreaks yellow fever until the contrary is proven. Dr. Porter, president of the Board of Health, Oct. 6th, telegraphed from Key West "The epidemic is over." From Tampa advices dated Oct. 7th, says 20 cases and 4 deaths—a panic prevails. On 25th., 27 more cases.

Diphtheria in St. Louis.

Prevalent as the disease is everywhere, entitling it to the name given by Hirsch, 'the world's pestilence,' St. Louis has for a long time been very subject to its ravages. The flat situation of the city seems to be favorable to its spread; but in all probability an outbreak due to defective drainage has become a centre of infection for a whole district since in 1886 there was no marked relationship existing between the prevalence of the disease and the older parts of the city.

OUTBREAKS IN CANADA.

Diphtheria and Typhoid Fever.

These two filth diseases are prevalent in some places; almost epidemic in many localities. Some of these have figured notably in the public press, *e. g.*, Toronto, and London West. But the fact of their condition being discussed in the daily press does not make the local prevalence in other districts any less. The mortality tables for the month of September amply indicate this.

Montreal's death rate in September reached 30 per 1,000 of population. There were 35 deaths from diphtheria and 22 from typhoid.

"Stratford Hospital," Brantford, is said to have had fifteen cases of typhoid at once there during the past month.

Diphtheria has been very prevalent on the flat lands of Moulton Township, and has broken out in Sandwich West. Saugeen, Albermarle and other places in the Bruce peninsula are similarly suffering. The endemic prevalence of this disease is indeed remarkable; but when water from barnyard wells is used, as it has been in many places during the past summer, there can be no wonder at the result.

HYGIENE

City Milk Standards in their Relations to Health.

(Correspondence.)

BY JAMES CHEESMAN, ESQ., TORONTO.

[THE intimate relations frequently existing between disease and milk supplies are daily becoming better appreciated by both the profession and general public: but much needs to be yet investigated and communicated before even medical men thoroughly comprehend the real significance of good milk, both as a carrier of disease, and as the most important of all the articles of a dietary in disease. We congratulate our readers in having so well-placed before them in MEDICAL SCIENCE, this subject by a gentleman who has long conducted the *Dairyman*, and as an analyst has had the opportunity of practically investigating the whole subject.—ED.]

Various regulations have been proposed with a view to prohibiting this or that kind of food, as for instance distillery slops, slaughter house refuse, and other forms of waste. It is often overlooked that the object of feeding such refuse is to increase the flow of milk at the expense of its quality and especially is this the case where low prices prevail.

There is no easier way of demonstrating the truth of this proposition than by quoting the example of the public milch cow competitions. Formerly it was the practice to give the prizes to those cows which gave the largest quantity of milk without the slightest regard to the quantity of total solids, or the proportion of butter fat contained in the milk, or the distance from calving or the length of time the cow had been in calf. In such competitions the milk would seldom average above 11–50 or 11–75 per cent. of total solids of which less than 3 per cent. was butter fat. The cause was not far to seek, and was invariably found in the mode of feeding, which consisted of rations composed of sloppy food of low nutritive value supplemented with roots.

In the present day feeders work with very different rations, composed mainly of grains rich in oil and nitrogenous matter supplemented with just enough coarse fodder and roots as to make the whole digestible and profitable. Whereas under the old system it took about 11 or 11¼ lbs. of such milk to make one of cheese or about 30 to 34 to make one of butter, we can get with modern economic rations, one pound of cheese from six or seven pounds of milk, or one pound of butter from fourteen to twenty-two pounds of milk.

If throughout a working season of six months Ontario creameries can make one pound of butter from twenty-five pounds of milk, and Quebec creameries can produce the same quantity of butter from 22½ pounds of milk, surely there is nothing unjust in asking that our city milk supplies should show a higher average per cent. of butter fat than they now do. A recent document issued by the Inland Revenue analyst, reports the following as the averages of quality obtained at the places of examination:

PROPORTION OF BUTTER FAT.

	Highest.	*Lowest.*	*Average.*
Halifax	5.40	3.00	4.24
St. John	4.62	3.43	3.91
Quebec	4.18	3.02	3.54
Montreal	5,17	2.80	3,82
Ottawa	5.29	3.62	4.26
Toronto	4.50	2.52	3.38
Total average			**3.86**

MILK SOLIDS AVERAGE.

Halifax	12–74
St. John	12–45
Quebec	12–39
Montreal	12–29
Ottawa	12–93
Toronto	12–08
Total average	**12.48**

From these data the analyst draws the conclusion that we should not adopt a standard higher than 12 per cent. of total solids, of which 3.5 per cent. should be butter fat. Surely if cheese factories and creameries can obtain milk from grass-fed cows for six months throughout the provinces of Ontario and Quebec of higher average quality than the city supplies examined by the official analysts it is only reasonable that we should expect as good milk for city use in summer, and in winter one of slightly improved quality when cows are fed on grain and other nutritious food, and prices are higher.

Before adopting its milk standard of 13 per cent. total solids, of which 3.7 per cent. is butter fat, the State of Massachusetts investigated milks from a much wider range of territory with the following results:

AVERAGE COMPOSITION OF MILK.

(By various authorities.)

Authority.	*Solids.*	*Fat.*	*Not Fat.*	*Ash.*
Paris Standard, 1887.	13.00	4.00	9.00	.70
Average of a number of farms near Paris By Adams.	13.10	4.10	9.00	.70
Report of Paris (1885) Municipal laboratory. Average of all authorities quoted.	13.30	4.00	9.30	.70
Babcock--Milk Inspector, Boston, 1885. Eighty samples as delivered by milkmen.	13.30	3.50	9.80	.70
Wurtz (leading French authority) average of a number of analyses.	13.50	4.00	9.50	.60
J. Carter Bell, average of 181 cows.	13.60	3 70	9.90	.76
New York Dairy Commissioner's report, 1885 - Average of 296 cows.	13.73	4.21	9.52	.71
New Jersey State Board of Health, average of 85 Dairies.	13.80	4 22	9.58	.65
Davenport. Average of 18 native cows	13.82	3.84	9.98	.64
Poggiale. Average of ten analyses.	14.00	4 30	9 70	.70
Average of a large number of analyses by Bouchardt.	13.30	4 10	9 20	.70
Davenport.—Milk Inspector of Boston, 1884, average of 31 grade Ayrshire cows.	13.32	3.70	9.62	
Cameron — Average of 100 cows of the Russell Farm, England.	13.40	4 40	9.00	.70
Cameron.—Average of 42 cows of the Agricultural Institute, Dublin.	13.40	4.00	9.40	.70
Davenport. — Boston average of 3 dairies of 56 cows.	13.45	3.79	9.66	.66
Sharples — Report of American Academy of sciences—average of 19 cows.	14.49	4.83	9.66	.66
Average of the above 16 authorities.	**13.53**	**3.91**	**9 62**	**.68**

In the month of November, 1885, 100 samples of milk from as many vendors, were analysed by the Milk Inspector of Boston. Of these ten were complained of in the municipal court.

The average of these samples including those below standard, was as follows:

Total solids	13.00
Fat	3.37
Solids not fat	9.64
Ash	.62

The experience of individual owners who are known to keep cows for profit, and the animals kept *without* grain at the Guelph College are known as furnishing milk with a composition above the one urged for adoption here.

It is a well known fact that milk producers and vendors invariably accommodate themselves to the requirements of law. As soon as a new law comes into force there is an immediate change of conduct on the part of those affected by it.

If the creameries and cheese factories had no better milk than our city supplies to work upon the business would soon cease to be remunerative. Few of those pay as high a price as 10 cents per gallon for milk, while all the milk sold in cities is at from 5 to 8 cents per quart—according to quality and locality.

If it be desirable to guard the interest of the ignorant, the dirty and incapable, by avoiding a standard too high, by all means do so, but let us not be restricted to the minimum. We have grades of flour, pork, grain, fertilizers and other goods subject to inspection, and why not of milk? If we must have a low grade, why not a middle, and a high grade also? If to be on the safe side for prosecutions why cannot we take the average as our standard and one better as our high grade. Thus we might adopt the following:

Grades.	*Solids*	*Fat.*
No. 1 Quality	14.00	4.75
" 2 "	13 00	4.00
" 3 "	12.00	3.50

The following range of values accords with commercial experience—milk having only 3 to 3½ per cent. of fat sells at from five to six cents per quart in the principal cities:

	Butter Fat per cent.	*Price per quart.*
Milk containing up to	3	5 cents.
" " "	3.6	6 "
" " "	4.2	7 "
" " "	4.8	8 "
Rich Jersey or Guernsey	5.4	10 "

The above prices are obtained in Montreal and Toronto—though the content of fat is not always uniform when the price is below seven cents. Dealers should be required to state which quality of milk they supply—number one, two, or three.

There is no surer way of protecting milk for town and city consumption than by ensuring that it shall first be from well fed cows; such milk will be sound, and be better cared for by the vendors than the thin and poorer qualities.