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THE LYMPH CIRCULATION IN MODERN MEDICINE.

BY

HUGH A. MCCALLUM, M.D., M.R.C.P., London,

Associate Professor of Clinical Medicine, Western University, London, Canada.

Owing to the illness of Dr. James Stewart, of Montreal, the address in Medicine was pressed upon me by your president and committee. In reluctantly accepting the honour, I recognized not only the short interval for preparation, but my inability to give such a popular address as the occasion calls for. In relying on your charity to-day, I accept the investment of this office, not as an honour, but as a duty.

On account of the time left, I must of necessity select a subject with which I have already been familiar. In announcing it as "The Lymph Circulation in Modern Medicine," one feels that we are treading upon a new continent of thought. It is a subject that is in intimate relation with every branch of medicine and surgery. The unsolved problems of physiology, pathology and therapeutics must find their final solution here. The final contributions in these three realms must be cytological, by painstaking study of the cellular elements. As cells of their own vital activity feed and oxidize themselves from the adjacent lymph stream, it must be basic to every problem in medicine how lymph is kept nutritious, and how it rids itself of its waste products. The tissue juice or lymph is not only the food of cells, but their sewerage system as well.

Two hundred and fifty years ago, Rudbeck discovered the general lymphatics, and gave the first conception of the irrigation theory of tissue nutrition. Hunter believed in the theory of tissue suction; Johannes Müller ascribed lymph to the vital activities of the living cells of the body.¹

In 1850 Ludwig propounded the theory, which bears his name, that lymph was renewed by filtration and osmosis. Twelve years ago, R. Heidenhain startled the physiological world with experimental evidence, which he claimed was fatal to Ludwig's theory. He experimented with certain substances, which altered in quantity or quality the

lymph coming from the thoracic duct; these he called lymphagogues. A great deal of physiological work has been done in the last twelve years in this department, and a considerable number of physiological authorities have fallen away from Ludwig's School, although not fully accepting Hiedenhain's theory of endothelial secretion from the capillary wall. The champions of Ludwig have been put to their wits' end in squaring the laboratory evidence with filtration, osmosis, and diffusion.

Before touching upon the contested theories, let us have a glance at the modern anatomy of the lymphatic system. Budge², thought there were two lymphatic systems. One of these disappeared in development. Ranvier, W. G. MacCallum, Sala and Florence R. Sabine have separately arrived at this conclusion, that the lymphatic system is a modification of the circulatory system, that it grows by budding backward from the subclavian vein, and gradually invades the tissues and organs, that these buds are closed or blind at their terminals, and have no physical connection with tissue spaces. Ranvier looked upon the lymphatic system as a great gland, the blind, protruding capillaries as the secretory parts, while the ducts were the excretory canals. These lymphatic capillaries are lined by endothelial tissue. The termination of the lymphatic system in the lacteal of the intestinal villus is a fair sample of its method of termination in other tissues. There are tissues like cartilage and the cornea which are never invaded by lymphatic capillaries. The lymphatic glands seem to be an after thought in development, as they are absent till we reach birds and mammals.

These anatomical and embryological studies bring us face to face with this; that we have included as one system the tissue juices and the lymphatic when in reality they are separate. The tissue spaces and their juices are not part of the lymphatic system. The fact that we have been considering two fluid systems as one demands strong confirmatory testimony of an evolutionary, pathological, and clinical character to be weighed with laboratory evidence in reaching a working hypothesis on this circulation.

The amount of lymph in the human body is difficult of estimation. Waller³, approximately estimated it to equal three or four times that of the blood. This estimate is probably too high, but the quantity of this fluid shows its marvellous importance. Florence R. Sabine, when suggesting the function of the true lymphatic system to be a system of absorbents, gives evidence obtained from a "specimen of twins prematurely born, one of which was normal, while the other was so edematous that it was simply a round ball. Examination of the edematous one showed no trace of a thoracic duct, nor lymph glands."⁴

The tissue juice circulation I shall call the lymph, and the other the lymphatic. As the lymphatic is one of the forces in the lymph circulation there will be no attempt made here to divorce them. Are we in possession of sufficient data to indicate the method by which lymph passes over from the blood stream to the lymph circulation? Does the balance of testimony point to lymph as a secretion a filtration, or a product extracted or sucked out by the vital activity of the tissues themselves?

If the field of inquiry be extended to embrace facts from evolutionary, embryological, physiological, pathological and clinical sources, the answer to the first question can reasonably be affirmed. The second question points to lymph as an independent circulation, and its forces are the vital activity of the tissues. It would follow that the lymph itself was an extraction product from the blood stream. The extraction process may have some of the characters of secretion and filtration. It is not to be denied that the physical laws of the liquid act in the body, but their scope in the lymph circulation is overshadowed by the selective action arising out of the vital activities of the tissues. The thing that most concerns us is that lymph circulation is an independent one.

Lymph will flow from the thoracic duct in some cases as long as four hours after the death of the animal. Ludwig long ago discovered that ligation of this duct was soon followed by rupture of it behind the point of ligature.

Harley by his experiments⁵ on the production of jaundice in dogs, found that when he ligated the hepatic lymph ducts and the biliary duct simultaneously, there was great danger of rupture of one of them. These experiments were conducted to show that bile gained entrance alone by way of the lymphatic circulation, but they also show an unsuspected power behind this primeval circulation.

There are evidently as many circulatory forces as there are tissues, each tissue possessing a method of its own in the selection of lymph. Easily understood examples of this may be seen in the vitreous humor of the eye, cartilage, bone, voluntary and involuntary muscles, epidermis, and hair. Their peculiarities will be discussed again at some length.

In addition to the ability of this circulation to continue for hours after cardio-vascular death, and independent of the latter forces, we see it the sole circulation in the vegetable kingdom, and the mighty trees of the forest are the evidence of its powers. It is the sole circulation in the lowest forms of animal life, and executes oxidation, excretion, secretion, vital movement reproduction and repair. It is the sole circulation in the early weeks of embryonic life of all individuals, promoting purpose-

ful growth, building the scaffolding and laying down the framework of all our human system.

Without question, the lymph circulation existed long before the cardiovascular, and was in possession of independent forces and functions. Can it be possible that this ancient circulation, which called into being the cardiovascular system, would lose in the new comer its own identity and independence? Or was the cardiovascular system secured for greater importation and exportation facilities?

The studies of Dr. A. B. McCallum on the inorganic composition of certain sea forms and sea water show that the former's degree of salinity can only be explained on the ground that the cells lining their gastro-vascular channels and the covering cells have a vital selective action. Speaking of the inorganic composition of blood plasma and its strong resemblance to ancient sea water the author says, "these can hardly be mere coincidences, and they seem to indicate that the properties in plasma are an ancestral feature derived from a form which had its habitat in the ocean in the earlier geological periods, when ocean water was very much less rich in salts of magnesia than it is now. Just as in the Medusæ of to-day the gastro-vascular fluid is but sea water, so in the ancient oceanic prototypes of the Vertebrates and of Invertebrates which are provided with a distinct circulatory system, the fluid in their vascular channels which communicated with the exterior was probably but modified sea waters as regards its inorganic constituents, and in the long period of time during which the forms were exposed to the conditions of such an environment a physiological relation between the tissues and the salts in their vascular fluids, in the proportions occurring in their environment, became so fixed and established that it was of necessity transmitted to the descendant forms living in different habitats, whether on land or in fresh water."⁶

By the blood stream, oxygen and nutrition are carried to the issues, and waste products are carried away. If we knew how oxygen was utilized by the tissues, it would give us "scientific anticipation" of the *modus operandi* of the other functions of the lymph circulation.

The history of the physiological teaching of oxidation is interesting. The ancient belief that arteries contained air and carried it to the tissues was abandoned after Harvey, and in its place came the teaching that the lungs were two furnaces burning up the waste products carried to them. Then followed the teaching that the blood oxidized the tissues through walls of the systemic capillaries. This was replaced by the teaching that blood oxidized the perivascular lymph, and the tissues became oxidized by contact. The present day teaching is that cells oxidize themselves by their own inherent vital activity. By their own

instinct they seize the oxygen in the lymph and cast back their products of metabolism, products of secretion and excretion.

Internal secretion and excretion are cast from the lymph stream to the blood stream simultaneously. The giving up of lymph by way of the thoracic duct is a very remote and fractional part of the interchange.⁷ The interchange is almost entirely effective between the lymph spaces and the blood capillaries. It has been found that when an animal is being bled the later portions of blood are more dilute than the first, and this is the case whether the thoracic duct is ligated or not.

Experimentally, we know that from the hind limbs of an animal at rest no lymph flows. By kneading the muscles a free flow can be induced. Passive or active movements of the limbs bring about a free flow. It is known that in the quiescent state lymph coming from the thoracic duct is from the viscera. Glandular or muscular activity takes front rank as increasers of lymph flow.

In harmony with the post-mortem flow of lymph, examination of the web of a frog's foot after the heart has been cut away or the vessels clamped, movement in the blood capillaries will continue from five to fifteen minutes thereafter; when all movement has ceased, it will return if some irritant be applied to the web.

It seems that the lymph circulation being more ancient and stable continues after cardiovascular death. A student whose mental make up enables him to see the other side of things, said in my class that "blood is simply mixed lymph with peculiar cells floating in it." Whatever we find in the serum we know has been cast there by the lymph.

A study of the blood serum is practically a study of general lymph. All the modern studies of serum will apply to the lymph. The causes of vital movement must be analyzed before we gain a clear view of lymph circulation. Evolutionally, this principle must be true, that all protoplasm, not undergoing vital movement in offensive or non-nutritive media must have been lost in the evolutionary process. This must be the basic explanation of all vital movement. By vital movement is meant not only contraction, but intervening relaxations.

The contraction of voluntary muscle is a powerful expulsion force on lymph within its sheath. Now before a voluntary muscle contracts, there is a carbohydrate explosion—giving rise to carbonic-acid, sarcolactic acid, etc. This takes place in the latent period before the visible contraction and changes the reaction of the muscle from an alkaline to an acid reaction. The contraction which follows upon this expels large quantities of lymph. Here clearly vital movement was inaugurated by offensive lymph and the purpose was to expel it.

Now the great stimulus to involuntary muscle movement is venous

blood, lymph obtained from venous blood surcharged with waste products; offensive lymph is the stimulus.⁸

It is interesting to note the wide distribution of involuntary muscle. We find it composing largely the walls of each hollow viscus. It is fully distributed in the stroma and capsules of glands and organs. And I would venture to say that more than one-half the involuntary muscle of the human body would be found to be in the immense area of the skin. Its slow rhythmic contractions with intervening relaxation suggest a tardily beating heart. The attachment of the erector pili muscle to the root sheath of the hair in such a way as to pump nutritive lymph into the hair shaft, and the acting of the ciliary muscle on the canal of Schlemm are two examples of this involuntary muscle acting as lymph to have associated with it in this action white fibrous and yellow elastic tissue. In the lungs the lymph circulation is almost wholly effected by voluntary muscle, during inspiration producing vacuum in the chest cavity, which would favour lymph entrance into lymph spaces and reservoirs.

The expiratory effort effected in natural breathing almost entirely by the elastic recoil would act as a pump to expel.

I have said enough to show how varied are the ways in which the forces act. Vital movement is best seen in muscular tissue, but is not peculiar to it, as doubtless all tissue is capable of some degree of vital movement. Vital movement does not always take the form of contraction, thorough relaxation may fill the enclosed spaces with lymph and dilute the offending lymph.

The lymphatic glands, spleen, uterus, intestines, ureter and bladder undergo variation in volume, rhythmically due to their involuntary muscle, and this will continue even when removed from the body. The rhythmic flushings of transparent parts (Albino rabbits' ear or bats' wing) and periodic variations in volume of one's arm (when in a plethysmograph), are explained as arising from this smooth muscle tissue. Traube-Hering blood pressure curves seen in states of asphyxia are similarly induced. We have the same rhythmic contraction of the walls of the lymphatic duct, and the intestinal lacteal is emptied by this tissue.

Offensive lymph inaugurates the respiratory and cardiac movements. Note how both will speed in states of asphyxia. A piece of steel embedded in the cornea has long taught us that this nonvascular structure can vascularize itself. This can only be explained on the theory that the tissues effected this by suction. Inflammation under such a view of lymph circulation would be simply excessive selection or extraction of fluid and cells from the blood. In states of asphyxia the lymph

coming from the thoracic duct is often bloody, an effect to be expected if the tissues secured their own lymph.

Now what does one mean by offensive lymph? Lymph may be offensive in being devoid of oxygen and nutrition, or containing metabolical and chemical products; high or low temperature would be an offense (to warm blooded animals), high or low pressure, vibrations and certain electrical variations. It is one's right to question "why" as often as "how." Adaptation of pathological process is an axiom in pathology, but there are countless examples in physiology. The adjustment of the iris to varying degrees of light is one of these. Here we see involuntary muscle adapted to expel offense. Heidenhain gave two divisions of lymphagogues, those increasing the water and those increasing the solids. I need not burden you here with details except to say certain salts like magnesium sulphate are powerful lymphagogues. This agent acted first as a lymphagogue, and secondly as a purgative. It is well that internal excretion should precede external excretion.

The lymph passing over to the blood stream contains defensive fluids, as well as waste products. Hence purging within certain limits may be a form of serum therapeutics.⁹

The action of the secretions of the ductless glands has not been brought into this discussion, but they vitally act on the tissues, and consequently on this circulation. The two most powerful agents in interchange of lymph are the muscular systems. They voluntarily expel lymph from their own body, and their sheaths, tendons and attachments, and place, as far as the limbs are concerned, this circulation almost wholly under the control of the will. The influence of the brain over the movements of the involuntary muscles is less than over the voluntary. The emotions can play upon this circulation almost past belief in some individuals.

To consider the skin as a system of external drains is to consider it not an important organ. The enormous amount of involuntary muscular tissue; the ability to corrugate itself to resemble "goose skin" in states of chill and fever, myodema and dermatograph from strong or weak strokes to its surface, and the experimental evidence that stimulation of the pilomotor nerves, causes contraction in the skin, especially over the genital region,¹⁰ will justify one in speaking of the skin as a great lymph heart. The skin's elasticity alone would make it that. One can scarcely separate the lymph heart action of the skin from some of its several other functions, it being sensory surfaces upon which are inaugurated impulses of pressure, temperature, pain, etc., which in turn set up reflexes of various kinds that keep the body adapted to environments. If the skin be considered the external body world, it arouses,

defends, and stimulates the inner mechanism more than can easily be conceived.

In order that I may not be charged with running thoughts till they are out of breath, I may bring forth Head's conclusions,¹¹ that each viscus had a definite segment of skin that would show sympathetic pain when the former was irritated. He assumed that impulses can reflex the other way, that irritation of the skin over these areas would have trophic influences on the corresponding viscus. The so-called "lung reflex," described by Abrams,¹² shows that this is true. By irritating the skin over the lung by means of cold friction, or Faradic currents dilation of the lung ensues, and an increase of the blood in that lung follows.

This is evident by obliteration of apex beat, cardiac and splenic dullness, along with the appearance of hyperresonance or percussion, and a more definite lung outline under X-rays.

Whether intra-spinal or intra-ganglionic, excitement inside is communicated to the skin outside, and vice versa. Beneath the skin both superficially and deep are great laboratories that can be aroused to feverish activity by stimulus applied upon the cutaneous surface.

By contraction of this great lymph heart, interchange of lymph and blood is effected, and the lymph passing over is a mixture of excretion and secretion, waste products and proteids, to defend the whole organism. It appears that the outer world excitement is accompanied by increased activity inside, else we had never been in possession of a heat regulating mechanism.

You well know the nervous mother who will make a hot-house plant of her child. There comes a day of exposure, and the child has "caught cold," has bronchitis, pneumonia, nephritis or gastro-intestinal catarrh. The *modus operandi* of "catching cold" is this: the lymph stagnates from want of proper skin stimulus which would be cold. The application of cold to the skin produces a powerful interchange, driving the excretory organs to overwork. Over-stimulation, from clinical evidence, we know can end in inflammation. The child who has daily exposures has his waste products sent into the blood circulation in dosage. The daily exposure is itself a tissue arouser and tonic.

No biological worker now-a-days denies organic evolution, but for the reason that the "how" entirely dominates the "why" it has not been pushed into the explanations of purposeful phenomena. From the inception, there were certain forces that act upon organic growth and will continue to act for all time.

Shall we ever know the full meaning of "sunlight" giving us light

and darkness; air with its varying shades of dissipation of heat from objects; and the medium of vibrations; the changing seasons with their variation of heat and cold; the cold and warm rains cleansing the air, plants and animals, and furnishing fluid for internal use to all? What a cluster of blessings. Try them on the human organism, and everyone plays on its cutaneous surface. Without the sunlight we had no eyesight, without vibration in the air we had no hearing, without the whole group we had not our cutaneous sensations.

In the open-air, sunlight, and forced feeding treatment of phthisis, we go back to the primal forces of organic evolution, and we have staggered upon them not by intelligent grasp, but by accident. Have we conceived the full range of possibility of the skin as an inaugurator of impulses and movements, and the uses of these in maintaining normal health, and in treating disease? We use in typhoid fever, the cold bath and secure rhythmic discharge in dosage of the harmful toxins and of defensive proteids into the blood circulation. In typhoid fever the height of the temperature is merely the indication, the reduction merely the accident of the treatment. We use massage to move stagnant lymph in conditions of neurasthenia, melancholia, Glenard's disease and other forms of mal-nutrition.

The relation of the modern treatment of tuberculosis to the lymph system is easily indicated. The forced feeding enables the cells' inherent activity to obtain the material for the formation of the defensive proteids. The sunlight and fresh air stimulates the skin not hourly, but almost continuously to activity, that defensive proteids may constantly flow into the blood stream to enable the long drawn out battle to be won on the side of life. Stagnation of lymph can occur from both warmth and cold. This is overcome in typhoid tubing by friction.

If one concede so much to the skin as an inauguration of defensive process, what shall we concede to the great master tissue, the central nervous system in this regard. The influence of mind on the body has not yet attained its full recognition in medicine. The invigorating effect of sane courage in arousing the whole bodily forces is a medical axiom from the beginning of time.

" Know then, whatever cheerful and serene
Supports the mind, supports the body too.
Hence the most vital movement mortals feel
Is hope; the balm and life blood of the soul."

The splendid practice of training the sick mind is far too little used. The neurotic should be taught to cease complaining, to minimize his actual objective symptoms and to train his body and mind to gradually

increasing periods of alertness as well as periods of absolute repose. Had this been more generally done by the profession there had not arisen in the land a cult who appeal to the mystical to heal disease.

I shall not stay to discuss the relation, which exercise, inflammation, hypertrophy, atrophy and repair bear to this hypothesis. You will doubtless see that our attention must be fixed on cells, and the best method of securing their fitness to fight morbid changes. Chemistry and physics give many phenomena a meaning adaptive to our understanding, yet there are innate properties in cells put there by evolutionary factors that must be baffling to all science.

As one understands more of the whole biology of the human body he turns less to drugs for curative agencies. The body must be considered as a community of cells, and as a united state possessed of a wonderful ability to organize its land and sea forces. All therapy must be measured by its effect on the organization of these forces. In treatment, the great object is to make the human body into the very best fighting machine against the invading enemy, primary or terminal infections. More terrible to a waiting camp than the enemy's weapons are water and food famine and stagnant sewerage. Mal-nutrition and stagnant lymph mean to the human body what famine, polluted sewerage, and destroyed ammunition mean to a regular army, capitulation without terms.

In conclusion, I trust your curiosity has been aroused, for my attempt has been merely to lead you to a hill-top in this new continent of thought, and to point out the complex landscape and the open roads. It may be true the valleys are hidden with mist, and the mountains with clouds and the soil is yet to be enriched by the growth and decomposition of thousands of ideas, but, nevertheless, this is the land that will yield us fruit, the eternal biological verities.

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SKIN-GRAFTING IN OPHTHALMIC SURGERY.

BY

FRANK BULLER, M.D.,

Montreal.

We all know that ophthalmic surgery presents many opportunities for the useful application of skin-grafting in both mucous and cutaneous surfaces, and that our work in this field necessitates extreme accuracy in order to insure reasonably good results. In any event, it will be conceded that upon this subject the last word has not been said. It is often desirable—I may say, indispensable—that we employ as much of the skin texture as possible in order to minimize the tendency to subsequent shrinking and loss of pliability; this is a totally different matter from the mere restoration of epithelium to a widely denuded surface, which may be accomplished by the use of extremely thin shavings from the skin surface, or even by scrapings, but for such a purpose ophthalmic surgery has no use, since there is always a necessity for the transference of skin of substantial quality and thickness. This necessity carries with it all the elements of failure, just in proportion to the size and thickness of the graft; we cannot, however, afford anything less than complete success at the first attempt, because the parts are not likely ever again to be in a condition so favourable for obtaining a perfect result, as they were the first time the operation was performed.

By complete success I mean re-covering of entire raw surface with integument, which unites immediately and permanently without the slightest flaw or loss. Judging from the published records of such work the difficulties in the way of obtaining satisfactory results are very great and failures have been many. The causes of failure may be summarized as follows:—(1) The size and thickness of the graft may be so great that it fails to become nourished sufficiently and so perishes through lack of vitalizing power. (2) Imperfect coaptation, so that some part of the new skin fails to secure nourishment. (3) An imperfectly prepared surface, especially as to arrest of bleeding. (4) The parts may not be sufficiently aseptic. (5) Accidents or injury before healing is well advanced. Failure from the first of these causes can fairly be attributed to an error of judgment on the part of the operator; failure from the third and fourth implies an error in technique; from the fifth, a want of proper care in the after treatment. There remains for consideration only No. 2; and this is by far the most-important of all. The problem to be solved is how can perfect coaptation best be secured. In this connection the fact must be recognized that every skin-graft

consisting of more than a mere epithelial shaving, tends to roll in upon itself towards the cut surface. This tendency cannot be controlled by merely laying the graft upon a raw surface, nor can it be perfectly overcome by fastening the graft in its place with stitches, since the intervening portions between each stitch will continue to turn inwards. Now this unfortunate tendency becomes a fatal obstacle to union at the edges of the graft, and in addition a sort of sulcus is formed in which fluid exudate collects and readily becomes septic, besides separating the graft more from its base and source of nourishment. In order to overcome the difficulties arising from this peculiarity of the skin, I sought for some means to make it stay in position with an absolutely perfect spread throughout. For this purpose I found ordinary silk isinglass plaster entirely satisfactory; some experience is required in order to secure the maximum adhesive quality of the plaster just at the right moment. I find it best to have the plaster cut in convenient strips, a certain area of which is carefully moistened just enough to make it very sticky, then the graft, cut as nearly as may be to the size required, is transferred dry from the razor with its epithelial surface on to the plaster; then with a silver curette it is stroked and spread until completely adherent. When this is done, both skin and plaster may be trimmed with sharp straight scissors exactly to the size and shape desired. If the surface be large it may be covered by several neatly trimmed pieces of skin prepared in this way. Over the whole I next place a piece of cergile membranc, dust with finely powdered iodoform, pad with cotton wool in such a way as to secure gentle, but tolerably firm and uniform pressure.

Skin-grafts applied in this way after Thiersch's method, even when large do not fail, they all survive and adhere perfectly to the surface, this, too, when applied where mucous secretions may be present and would otherwise lead to infection and destruction of the graft. There are two distinct classes of cases in which skin-grafting is required in ophthalmic surgery; the first of these and by far the more common is when the skin of the eyelids is deficient, and the defect may best be repaired in this way, that is to say when sliding flaps are not available; the second is where the conjunctiva is at fault and requires to be repaired by some sort of integument, either skin or mucous membrane. Such a requirement occurs in certain cases mostly of traumatic origin, in which the palpebral and ocular portions have become adherent, and also in cicatricial contraction of the conjunctival sac, such as takes place from persistent wearing of an artificial eye, long after it has become roughened by continued use. The method is applicable in all cases suitable for this form of plastic surgery. There are one or two points in

regard to preparing the surface to be grafted upon, that invite further remarks. In the first place, it is entirely essential that all bleeding has ceased before the grafts are applied; strict asepsis at every step is also indispensable. Then again, the surface should be put upon the stretch if need be by sutures through adjacent parts, which may be attached to adhesive plaster on the surrounding surface, an arrangement, of course, of a temporary character; for instance, in repairing contractions of the empty conjunctival sac, it may be necessary to do a canthotomy at the outer canthus, and draw the loosened lids strongly upwards and downwards by sutures passed through them and attached as indicated. Lastly, when the grafts are in place great care is necessary in applying a bandage with the double purpose of protection and of making gentle and uniform pressure so as to prevent the hæmorrhage of reaction.

There is nothing in ophthalmic surgery, at least in the writer's experience, more gratifying than the perfect results obtainable from skin-grafting carried out in the manner just described.

THE INTER-RELATIONS OF DIABETES AND OTHER CONSTITUTIONAL STATES.

BY

GEORGE F. BUTLER, M.D.,
Alma Springs, Michigan.

The great error dominating conceptions of disease in their clinical and therapeutic aspects is that which fixes upon one symptom as a test of disease rather than the symptom complex. Perhaps in no disorder is this better illustrated than in diabetes. The predominant symptom of diabetes is glycosuria. This condition may not only be an expression of many diseases, but may be at times merely the result of excess in carbo-hydrates. Glycosuria occurs in all the neuroses, not as a complication but as an expression of metabolic instability resultant on nerve disturbance.

The vaso-motor nerves of the liver have their origin in the floor of the fourth ventricle and pass through the cervical and upper dorsal regions of the spinal cord, the rami communicating opposite the fourth or fifth dorsal vertibræ to join the sympathetic and enter the liver as the hepatic plexus. Injury to the fibres at their origin in the fourth ventricle, in any part of the spinal cord, or of the sympathetic itself is followed by glycosuria. Conditions such as express themselves in glycosuria and allied sub-oxidations readily occur in the neuroses. Hysteria may be complicated for instance with glycosuria of transitory or prolonged duration, which may eventuate in coma of an apparently

diabetic type, but disappears with the disappearance of the most marked hysterical symptoms. The great neuroses, parietic dementia, locomotor ataxia and epilepsy, occasionally display temporary glycosuria.

Delirium tremens and the confusional insanities may at times have a temporary glycosuria. Every one of the febrile conditions may be glycosuric. Conditions in which respiration is involved are often accompanied by glycosuria. Pregnancy being a condition in which there is over nutrition, faulty elimination and resultant imperfect oxidation is often attended by glycosuria. The patient may be glycosuric only during pregnancies. Glycosuria may come on during pregnancy and be present during the period only, or it may occur immediately after pregnancy is terminated and may recur sometime after and may remain for a long time after pregnancy and then suddenly disappear.

Gout and insanity of the auto-toxic types frequently alternate with glycosuria. During the mental disease, or during the gout glycosuria is absent, and its reappearance is an indication of recovery while its disappearance is the precursor of an attack. What is true of glycosuria is likewise true of the states allied to it, acetonuria, etc. Every one of the acids from sugar metamorphosis, may be formed in the urine of persons with depressed mental states, after the apoplectic and epileptic attacks of parietic dementia, the crisis of locomotor ataxia and the status epilepticus.

Independently of the symptom complex diabetes, there are states of which glycosuria is a symptom consequent on suboxidation, which they produce, that are temporary in character and have not the permanency characteristic of the disease diabetes. Many neuroses, however, are an expression of the suboxidation states constituting diabetes. In all of these, glycosuria may disappear just previous to cerebral complications. The disappearance of glycosuria very often is an expression of imperfect elimination through renal insufficiency rather than a disappearance of sugar from the system. In a diabetic patient in a severe state of hyper-glycemia, sugar may be absent from the urine, yet the patient may pass into acidosis with resultant coma. Neurotic manifestations of diabetes comprise lesions of motility, of general and special sensibility of the intelligence and of trophic functions. Among the most marked motor manifestations are fatigue, lassitude, and deprivation of muscular energy which does not depend upon muscular weakness pure and simple, but may strongly suggest an affection of the medulla. It is not always well marked. It may suddenly disappear to return as suddenly, and may first occur in consequence of a slight traumatism. Apoplexy with complete coma may occur, followed by hemiplegia, recovery from which may be rapid and complete.

Sometimes there is sudden loss of consciousness which disappears so rapidly without resulting paralysis as to suggest epileptic states. Vertigo sometimes occurs alone, and sometimes precedes paralysis. Paralytic symptoms occur without loss of consciousness. Hemiplegia may be attended by very bizarre phenomena. In one case a left hemiplegia was accompanied by a monoplegia of the right eyelids. Monoplegias are very frequent in diabetes and are apt to be extremely transitory. Paralysis of the right arm and face, ptosis, pupil dilatation, strabismus, and hesitancy in speech may follow glycosuria. While speech disorders are generally due to buccal dryness, yet true aphasia occurs, and aphonia from laryngeal paralysis is far from exceptional.

Imperfect muscular co-ordination in the dark, attended by formication in the extremities may lead to a suspicion of locomotor ataxia. Cramps of the akinesia algera type frequently attack the lower extremities, especially at night and play an important part in the production of insomnia, being often the first indication of cerebral circulatory disturbance and may be precursors of serious complication. Convulsions may be associated with coma, or may accompany paralytic phenomena. At times they present the monoplegic epileptic character and alternate with transitory paralysis of the same side.

Diabetic vertigo often assumes an epileptoid character. Asthma, exophthalmic goitre, and other respiratory neuroses are not infrequently temporary expressions of diabetes. Underneath them and many diabetic neurotic states, lies the "air hunger" of the tissues which is simply their expression of the need of oxygenation.

Diabetic absorption of oxygen as Voit, Peltenkoffer and others have shown, is much less than the normal, and decreases till toward the end of the disease when it is hardly half the normal quantity. Carbon dioxide exhaled is proportionally reduced. This oxygen decrease Sajous ascribes with much plausibility to supra-renal disorder. Increased supra-renal activity, as Croftan has shown, can so augment the ferment producing power of the pancreas as to greatly increase sugar elimination through increase of the amylolytic ferment supplied by the pancreas which converts the liver glycogen into dextrose.

Herein lies the explanation of neuropathic glycosuria and of diabetic neuropathies. In the first, the cause is primarily in the cerebro spinal system. In the second, the system composed of the liver, pancreas, spleen and adrenals is first affected, and the resulting toxic products because of disordered oxidation, cause the nervous symptoms.

The most furibund symptom of diabetes is coma. Under this title are included many conditions, varying from mental depression, through apathy to stuporous states with or without absorption in agonizing

dreams or delusions. One of the most distressing conditions of partial stupor is that attended by psychic nausea where the nausea conception is intense, but unattended by gastric disorder. Cases of this type often occur just after seeming coma, the patient refusing treatment because he believes his stomach is too squeamish to retain medicine. As the mental state is attended with loss of determining will power, like most depressional, stuporous or apathetic conditions, this psychic nausea and its effects are readily overcome by large doses of a saturated solution of sodium bicarbonate. Tablets should not be given as they irritate the throat, thereby increasing the strength of the psychic nausea.

Nearly all the mental features of coma and its allies just mentioned, centre, like all depressional mental states attended by acidosis, around the medulla oblongata. This is the origin of the cardiac, pulmonary and gastric instabilities which occasion such alarming features in the comatose and apathetic conditions of diabetes. The starting point of these disorders is central not local. The cerebral centres of the lungs, heart and stomach being disturbed, local excito-motor ganglia have undue play and become exhausted. Resultant local disorders underlie the diabetic endocarditis, diabetic myocarditis, diabetic phthisis, diabetic gastritis, etc. Diabetic skin, and diabetic tissues are, moreover, pre-disposed to microbial attack.

The etiologic moment of coma, comatose and stuporous states consists first of the condition of the patient at the time of the attack, and depends largely upon the condition of the excretories. The kidneys may be in good condition themselves, yet because the intestines are acting imperfectly with fecal resorption, the kidneys are overworked, as is shown by the presence of an excess of indican and urea in the urine. Secondary to this occurs renal insufficiency with resultant acidosis from retention of imperfectly oxidized sugar products.

Given the muscular changes which produce B—hydroxybutyric acid, acidosis production with decreased elimination is intensified. The skin in diabetes is very deficient in eliminative power which adds to the work of the kidneys. The lungs cannot quite supply the oxygen ordinarily needed, not to speak of the increased amount required for diabetes, much less can they oxidize products unphysiologically eliminated through them. The lack of oxygen increases depression and apathy, which in turn decreases cardiac and lung energy. The liver has its nerve energy lessened, yet has increased poison destroying work thrown upon it. The diabetic patient when elimination is lessened is in a very serious and unstable condition which the slightest shock will jar into coma, a comatose state, an epileptiform or apoplectiform convulsion. The premonition of these is generally given by lessening polyuria, sup-

pression of urine, or by the finding of cylindroid casts, then, hyaline or granular casts. Albuminuria *per se* often means merely the urethral or prostatic irritation of diabetes. These as predisposing to microbic attack are of serious augury, but not as to coma, etc.

The sudden disappearance of sugar or sugar acids with increased casts is ominous of renal insufficiency and resultant toxæmic cerebral states.

Another part of the etiologic moment is the condition of the arteries, whether due to diabetes, age, lues, rheumatism, gout, the exanthemata or mental or school overstrain.

Apoplectic extravasations during the coma, epileptiform or apoplectiform states may here lead to permanent mental or nervous disorders.

Hereditary defect may show itself in the etiologic moment peculiarly at the periods of stress: 2 to 6, 12 to 14, 14 to 25, 45 to 55, and from 60 on, when the system is undergoing evolution or involution.

There are many eye, ear, nose, throat, gums, skin, and genito-urinary phenomena found in diabetes which bear one of these relationships to the disease. They are an outcome of diabetes and are modified by it, or modify it, and finally they may be mere coincidences.

The common erroneous assumption that morbid states occurring during a diathetic state are due to it, is peculiarly accepted as to diabetes. While there is more truth than usual in the assumption as regards diabetes, still treatment of these local conditions will often do as much to relieve diabetes as treatment of diabetes does to relieve them.

The so-called "reflex" disorders exert their influence on the general constitution through continuous nerve irritation producing nerve waste and resultant autotoxemias, which, as has been shown are a peculiarly dangerous addition to the general burden of the diabetic. Treatment of all these conditions is required not only from the local standpoint, but likewise from the constitutional. This is especially true of the eye, ear, skin, gums, and genito-urinary system, whose disorders are certain to add to the atmosphere of worry, resultant nerve waste, and consequent toxic strain on the emunctories into which the diabetic is plucked.

Clinical study demonstrates beyond doubt that most cases of diabetes are at first expressions of nutritional and assimilational instability. In consequence of the overstrain on the liver, adrenals, pancreas, spleen and kidneys, what were at first merely biochemic changes in these organs becomes permanent pathologic lesions, continuing constantly in excessive sugar manufacture without proper oxidation or elimination.

PERITONITIS OF UNKNOWN ORIGIN.

BY

G. E. ARMSTRONG, M.D.,

Montreal.

More frequent and complete autopsies and a fuller knowledge of bacteriology have done much towards demonstrating the various infections of the peritoneum. While one may say without much fear of contradiction, that no peritonitis has started spontaneously, yet there remain a few cases occurring usually at long intervals in which the source of the infection cannot be determined at the autopsy. Osler reports 12 such cases in 102 autopsies, and in 175 post-mortem examinations made in the Montreal General Hospital on patients dead from peritonitis, there were five in which the cause could not be definitely determined.

Infections of the pleura and pericardium are not always traceable, but the operator or pathologist can generally put his finger on the source of peritoneal infection. The five cases occurring in the Montreal General Hospital in which at the autopsy no cause could be found, were all females. In two of these five cases death was due to a widely generalized streptococcic peritonitis. In one of them the oldest condition seemed to be a pocket of pus running along the posterior border of the pancreas. The spleen was small and there was cloudy swelling of the liver. In the other the spleen was soft and pulpy. There was no ulceration of stomach or intestine, and the liver, gall-bladder and ducts were normal, the uterus and tubes healthy. The right ovary was cystic with greenish contents, looking like a deposit of blood pigment.

In the third case the bacteriological report was "infection by diplococci, apparently pneumococci." In the remaining two cases the bacteriological finding is not recorded. In only one was the streptococcus found in the fallopian tube and in none was it found in the cavity of the uterus. The fact that all the cases were in females is suggestive, and it is quite possible that a more thorough and systematic search would have found the same organism present in the uterus and tubes as was found in the peritoneal fluid. The vagina, uterus and tubes would seem a likely way of entrance, and these organs should certainly be most carefully examined bacteriologically in all cases where no obvious cause is present.

I have operated upon two cases of peritonitis where no cause could be found at the time of operation, and fortunately the patients recovered and escaped the more critical examination of the pathologist. The first was a married woman, 29 years old. She had attended a skat-

ing party whilst menstruating, and on returning home suffered from acute abdominal pain with vomiting. I saw her the following day. She had an anxious expression of countenance, a temperature of $102\frac{1}{2}$, a rapid hard pulse, marked tenderness over the lower abdomen, and a very considerable degree of rigidity of the abdominal wall. During the succeeding forty-eight hours the symptoms rather increased in severity. At the end of the third day of the attack it was decided after consultation with one of my colleagues that operative interference was called for. The diagnosis was peritonitis involving the pelvic and small intestinal area, arising probably from the appendix vermiformis.

On opening the abdomen the peritoneum covering the small intestine was found much reddened. There was a good deal of sero-purulent fluid present and some lymph. The appendix did not seem to be more involved than other parts. It was removed, on the ground that there might be more disease within than was apparent on the surface. A careful search failed to find any other cause of the peritonitis. The pathologist reported that there was no growth from the fluid. The appendix was normal except the serous covering, which was inflamed. He did not think the infection had taken origin from that point. The patient made an uneventful recovery. The cause of the attack is yet undetermined.

I will very briefly report one other case, that of a boy 5 years old. On May 2, 1903, he developed a pain in the left side of the chest, some cough without expectoration, and vomited on three occasions, a greenish bilious matter. His family physician, a most capable and painstaking man, thought there must be a pneumonia, but repeated physical examination failed to locate it, or even to demonstrate its presence. On the third day of his illness the vomiting recurred with great pain in the epigastric region, and general abdominal tenderness and rigidity. The abdominal symptoms were so severe that I was asked to see the child. His temperature was then 102 ; pulse 124 , and respirations 44 . The abdomen was hard, tender, and rigid, and the physician who had been watching him assured me that there was some rounding up of the abdomen. It certainly had that appearance. There was present a hacking cough, but no expectoration. The lungs were resonant on the right side to the 6th rib, and on the left side to the 4th rib in front, and to the 10th rib on both sides posteriorly. There were a few moist crepitations at the base of the right lung, in front, and a dry to-and-fro rub was heard at the angle of left scapula; the liver dulness normal, spleen not enlarged.

On opening the abdomen the appendix was apparently perfectly normal, and so were the coils of intestine that came in view. There was

considerable non-purulent fluid in the pelvis. On drawing down some coils of intestine from above, they were found to be of a bright red colour, and in places partly covered by lymph, and on separating the coils considerable opaque fluid escaped. There was no perforation of the stomach to be made out. There was no fat necrosis. After thorough irrigation with hot normal saline solution the abdomen was closed without drainage. The boy made a perfect recovery. On the 16th day after the operation the temperature, having been practically normal during the whole time, suddenly shot up to $104 \frac{1}{5}$ and the pulse to 160. It returned to the normal line the following morning and remained normal afterwards. The cause of the elevation was not apparent. The interest in this case is materially lessened by the fact that in some unaccountable way none of us thought of taking a culture at the proper moment. The cause of the peritonitis is here again, undetermined. Repeated careful physical examinations failed to detect pneumonia.

That peritonitis may occur in croupous pneumonia is well known. The Montreal General Hospital report No. 81, 1899, is an example. In addition to a double lobar pneumonia there was present a generalized peritonitis, due to an infection by diplococci. That it does not occur more frequently is remarkable, when it is remembered that in these cases the pneumococcus exists in the blood.

It would seem to be pretty well established that other etiological factors than infection enter into the resultant which we call peritonitis. The peritoneum is sometimes spoken of as a large lymph sac. It certainly has a wonderful capacity for rapid absorption, a quality which has a most important influence in the development of peritonitis. Wagner, Grawitz, Paulowsky and other experimenters have shown that many pyogenic organisms and foreign substances may be introduced into the peritoneum without apparently doing any harm. If, however, the peritoneum is previously injured, or a large quantity of virulent organisms is introduced, then peritonitis follows. The same result ensues when repeated infections are made, as shown by Tuffier, who found from experiments upon dogs and guinea pigs, that urine alone or mixed with blood could be injected into the peritoneal cavity without causing peritonitis. If, however, the ureter was transplanted and so arranged that it continually dropped urine, peritonitis developed slowly and the animals died in 8-20 days. The urine gradually softens the peritoneum and renders it vulnerable. Reichel concludes from the experimental work of Wagner and Grawitz and from a study of 174 laparotomies done at the Kgl. Universitäts-Frauenklinik zu Berlin, that in every laparotomy a certain number of micro-organisms gain entrance into the abdomen. When no unpleasant results follow, one may thank

the resisting power of the patient. This resisting power may be overcome by large or repeated infections, accumulation of infectious material in dead spaces and a lessening of the normal absorption and transudation processes.

How do these theories and experimental results harmonize with our clinical experience as physicians and surgeons? Two recent cases in the hospital wards may possibly illustrate my point. One of my colleagues recently had to do with a case closely simulating acute appendicitis. It was that of an adult male with pain and tenderness over the lower abdomen with some vomiting and elevation of temperature. A mass was felt in the right iliac region which could be palpated by the finger in the rectum and the hand over the right pelvic region. Incision revealed a solid tumour, which proved to be a sarcoma, growing from the border of the ileum about four inches above the ileo-cæcal valve. There was considerable yellowish turbid fluid in the pelvis, and a hyperæmic condition of the visceral peritoneum with a few flakes of lymph. What caused the peritonitis?

The other case occurred in my own practice. A young man 24 years of age had felt a good deal of pain in the abdomen for several weeks. At first it was felt more particularly in the epigastric region, but latterly in the lower abdomen. Ten days before I saw him in consultation with Dr. Wilkins, his family physician, he had had a rigor. Another rigor occurred the day of our consultation, the temperature rising to 103½°F. During the previous fortnight the patient had vomited several times.

On examination one first noticed the very anxious facial expression. The abdomen was somewhat tender over the pelvic area, and by the rectum one felt indistinctly a mass high up behind the bladder. On pressing in this direction the patient cried out. It was very tender. There was no tenderness over the region of the appendix. The presence of a localized peritonitis was obvious. On making an exploratory incision, there escaped fifteen or twenty ounces of a yellowish turbid fluid. The appendix was apparently normal. The coils of intestine that presented were highly injected. On separating them I came down upon a large retro-peritoneal mass situated between the layers of the mesentery and extending from two inches above the level of the umbilicus, down over the brim of the pelvis, within the layers of the mesentery pushing a coil of intestine down into the pelvis, along both borders more especially on the right side. Coils of intestine were joined to the borders of the mass by inflammatory adhesions. Lymph was spread over these adhesions. Here again, what caused the peritonitis? It may, I think, be granted that in each of these cases the circulation was more or less disturbed. The disturbance was probably of an obstruc-

tive nature acting on the soft walled veins returning the blood from the intestines. The circulation in these parts was impaired and a *locus minoris resistential* established.

In another interesting group of three cases a fatal streptococcus peritonitis developed. One of the patients was a young lad. In none of these cases could a cause be found, save that in all three, there were found enlarged retroperitoneal tubercular glands, one or two of them being in a state of caseation. The peritoneum over the glandular masses was not broken, it was not opaque or thickened, but in colour, thickness and in general appearance quite normal. In these cases an obstruction to the circulation in the lymph vessels evidently was present. These obstructive conditions involving the blood or lymph vessels, or both, must necessarily lessen the excretory power of the peritoneum, possibly also the transudation, to say nothing of the toxins developed within them.

Pneumococcic peritonitis is a rare condition probably not occurring in more than 1 per cent. of cases. What is the determining etiological factor in this small group? In a recent article, Jensen points out that the pneumococcus may be brought to the peritoneum from the pleura through the diaphragm, by way of the blood stream, from the genital organs, from the intestinal canal or from other abdominal organs. The determining influence so far as we can say at present probably lies in a lessened resisting power of the individual. This in turn may, so far as the peritoneum is concerned, be an influence that disturbs the circulation, particularly in the direction of producing stasis of the blood or lymph streams. I think that the experimental work done has thrown a flood of light on many of the questions connected with this important subject.

We are beginning to realize the very great difference in the extent of surface involved and in the virulence of cases of both acute and chronic peritonitis. The etiological factors being so varied and numerous, the result could hardly be otherwise. In fact the more one studies peritonitis the more one feels inclined to accept the suggestion of, I think, a French writer, to abandon the term peritonitis and adopt that of "infection of the peritoneum."

I think also that our hands are strengthened in dealing with this condition. The importance of strict dietetic regulations, and so far as possible, of establishing a healthy condition of the intestinal tube becomes obvious. Early operative interference in cases of pneumococcic peritonitis that presents symptoms of severity, which do not yield to other means should be treated surgically. These cases are sometimes severe and may end fatally if not relieved.

In gonococcic peritonitis the prognosis without operation is probably

better. The difficulty, however, is to differentiate before an incision and bacteriological examination.

There is a group of cases in which I have been much interested—cases in which peritonitis develops after child-birth. In 1894 I reported five cases, in four of which I myself operated, one case being operated upon successfully by my confrere, Dr. Perrigo. These cases are of great interest for two reasons: first, they demonstrated that many of these women may be saved, that the lesion is extra-uterine, although intra-peritoneal and involving the tubes and ovaries rather than the uterus; secondly, in one case, the lesion giving rise to the alarming symptoms was not connected with the generative organs at all. I feel quite sure that there are a few of these post partum infections of the pelvic peritoneum which are primary and might with advantage be dealt with by the surgeon.

SURGICAL TREATMENT OF TYPHOID PERFORATION OF THE BOWELS—WITH REPORT OF FIVE CASES.

BY

J. ALEX. HUTCHISON, M.D., L.R.C.P. & S., Edin.

Lecturer in Clinical Surgery, McGill University; Attending Surgeon, Montreal General Hospital.

In submitting the following brief histories of five cases of perforation of the bowel in typhoid fever, upon which I have operated during the past seven years, I am assuming that it is not now necessary to justify the operation. Our duty lies in carefully recording in detail the salient features in each case, that we may learn to recognize the condition at the earliest moment, and having done so, the operative technique which will give the best results, and the percentage we may hope to save.

Of the cases now presented, two are reported in the statistics published by Keen¹; four, including the above mentioned, in a paper by Armstrong,² covering all operations performed in the Montreal General Hospital for this condition up to May, 1902; the fifth, my first successful case, is now recorded for the first time.

Case 1. H. C., male, aged 19 years, admitted to hospital August 26th, 1897, the eighth day of the illness; strong and healthy previous to the onset the early symptoms of which were diarrhoea and slight vomiting.

On admission there were rose spots present over the abdomen, enlargement of the spleen, and high temperature. The treatment included cold baths.

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¹ Surgical complications and sequels of typhoid fever., Wm. Keen, Philadelphia.

² Annals of Surgery, Vol. 56, Geo. E. Armstrong, Montreal.

On the 16th day of the disease there was some general abdominal pain, associated with slight vomiting and diarrhoea; one stool contained a small blood clot. Cold bathing was discontinued and tepid sponging carried out.

On the following, or 17th day, perforation occurred. At 3 a.m. there was a sudden onset of pain in the lower zone of the abdomen. This was accompanied by a fall of temperature and increase of pulse rate. During the day rigidity developed. There was no distension; opium administered; operation 19 hours later.

The abdomen contained free pus and liquid faecal matter. A large ulcer with ragged edges was found in the ileum, six inches above the valve. Death followed in twelve hours.

Case 2. Z. C., male, aged 19 years, admitted to hospital August 12th, 1897, the 10th day of the illness. Perforation occurred on the 30th day; operation 13 hours later; acute general peritonitis present with free pus and faeces. Ulcer was found in the ileum close to the valve. Death followed in ten hours.

Post-mortem examination showed general peritonitis, although the suture line of the gut held a 32-inch column of water.

Case 3. J. C. W., male, aged 20 years, admitted to hospital October 27th, 1899; ambulatory typhoid. There was well marked general peritonitis present on admission, temperature subnormal, pulse 130. Operation was performed at once; ulcer was found in the ileum close to the valve. Marked improvement in the abdominal symptoms followed the operation, but patient succumbed to the general toxæmia two days later.

Case 4. W. C., male, aged 29 years, ambulatory typhoid, admitted to hospital October 4th, 1900, the 9th day of the disease. Onset was with diarrhoea and vomiting; Widal reaction present; temperature high while under observation; cold baths not used; perforation on the 12th day. At 2 a.m., patient was seized with severe pain in the hypogastrium, gradually extending over the whole abdomen, slight vomiting four hours later, no marked change in temperature or pulse rate, tenderness and rigidity quickly developed in the right iliac fossa. Operation within six hours. Acute general peritonitis was present with free pus and faeces. There was a large perforation in the ileum. Bacteriological culture showed colon and typhoid bacilli. Death twenty-four hours later.

Case 5. E. C., male, aged 33 years, ambulatory typhoid, admitted to hospital December 30th, 1902. For some months previous patient had been using alcohol somewhat to excess.

The onset of the disease was insidious and patient was not seen by his physician until a few days before admission. He then had typical

and active symptoms, but could not be induced to remain in bed. On admission it was considered the disease was in its 13th day; temperature 104; perforation on the 13th day.

At 5 o'clock in the morning, or seven hours and a half after admission, patient developed severe abdominal pain, limited to the right side, with rapid fall of temperature and increase of pulse, accompanied by vomiting and diarrhoea. Immediately there was well marked tenderness and rigidity in the right iliac fossa. Operation was performed within two hours. Free sero-purulent fluid and faeces were found in the peritoneal cavity, a large ulcer in the ileum, four inches above the valve, involving nearly the whole circumference of the gut, with a pinhole opening in the centre. Bacteriological culture showed mixed infection. A few hours subsequent to the operation, abdominal symptoms had disappeared, and during the following three weeks the case ran a typical typhoid course, developing rose spots and enlarged spleen, Widal reaction present; good recovery.

A word of praise is due to the night nurse on duty, and to the Medical Superintendent, Dr. Wm. Turner, for the prompt recognition of the perforation in this case, which enabled me to perform the operation without any loss of time. The operative technique was the same in each case. Ether was administered. The median in the early and the oblique lateral incision in the later cases were employed. The ulcer folded in. Lembert sutures of silk were used. The peritoneal cavity was irrigated by saline solution, and the abdomen closed, a drainage tube being left.

In this case, in addition, after the abdomen was closed, the cavity was filled with saline solution through the rubber drainage tube, which was then clamped, retaining the fluid within the cavity. The abdomen was kept covered with four or five large ice bags during the first few days subsequent to the operation.

In Dr. Armstrong's paper, before mentioned, 34 cases were operated upon, of which five recovered; in addition one other survived the perforation and consequent abdominal disturbance, but died later from typhoid toxæmia, showing 18.18% of recoveries.

In my series we have 20% of recoveries. I appreciate that this total is too small to base an opinion upon, still, compared with the larger table above mentioned the percentage practically corresponds, showing if anything that as we add to the list, the percentage of recoveries increases. Dr. Osler has expressed the hope that 50% of cases occurring in hospital should be saved. Dr. Cushing has suggested that a distinction should be made between cases operated on for perforation, and those which are operated on after well marked symptoms of general

peritonitis following perforation have developed, and also expresses the opinion that 50% should recover. I presume he means after eliminating the latter class. If this classification were applied to the series just given, I am satisfied we have already reached the 50% limit. Leucocyte count is not recorded sufficiently in my cases to be of any value.

THE SIZE OF THE PUPIL AS AN AID TO DIAGNOSIS.

BY

J. T. DUNCAN, M.D.,

Ophthalmologist to the Western Hospital, Toronto.

The general practitioner, no less than the specialist, notices in almost every case brought before him for diagnosis, the *size*, the *shape*, and the *mobility* of the pupils.

First in regard to the size, they may be contracted, or dilated, or they may be unequal, one being larger than the other. Then in regard to the shape, they may, instead of being circular in outline, be oval or irregular in shape. And in regard to the mobility, instead of reacting to the light (or other stimulus) they may be immovable, or fixed. Any of these changes suggest some abnormality, and it is the object of this paper first, to place on record the principal conditions in which these changes are seen, and second, to assist in the interpretation of these changes.

In order to understand the subject we must briefly glance at the anatomy of the iris; in so far as it has to do with the changes in the shape of the pupils. We will find that nature has provided a special means for the contraction of the pupil, and a special means for its dilatation. In the structure of this very vascular curtain is to be found smooth muscle. The fibres of this muscular tissue are arranged in two directions. First, we find them arranged in a circular manner around the pupillary edge, forming a sphincter of the pupil, and known by the name of the sphincter pupillæ muscle. The remaining fibres are disposed in a radiating manner, constituting the dilatator pupillæ muscle.

But another agency having to do with the size of the pupil is the blood supply. We know that the bulk of the iris is made of vessels, which lie like the spokes of a wheel, but close together. These vessels can be rapidly filled with blood, so rapidly that some authorities speak of the iris as belonging to the erectile tissues. The more the vessels are filled with blood, the smaller the pupil is. Now, without going into the nerve supply of the iris it will be sufficient to say that the sphincter muscle is supplied by the 3rd cranial nerve, the dilator fibres by the sympathetic.

The size of the pupil, then, is affected in three ways, 1st, by the sphincter muscle of the iris, 2nd, by the dilator muscular fibres, 3rd, by the blood poured into the iris. Anything which stimulates, or irritates, the 3rd nerve will cause the sphincter to contract, thereby lessening the size of the pupil. Anything which stimulates, or irritates the sympathetic nerves will cause the radiating fibres to contract, thereby dilating the pupil. If, however, we have stimulation of the 3rd nerve, with paralysis of the sympathetics, we will have extreme contraction (i.e. pin point pupils) while if we have stimulation of the sympathetic with paralysis of the 3rd, we will see extreme dilatation. What abnormalities or diseases are indicated by these various changes of the pupils?

A. The patient may have the pupils evenly contracted (myosis). This may indicate:—

1. Locomotor ataxia.
2. Meningitis.
3. Encephalitis (early stages).
4. Inflammations of the cervical cord (chronic).
5. Apoplexy of the pons.
6. Epileptic fits (early).
7. Uranic poisoning.
8. Tobacco amblyopia.
9. Inflammation of the retina.
10. Opium poisoning.
11. The use of myotics (eserine, etc.).
12. Long continued use of the accommodation as seen in watchmakers, etc., (occupation myosis).

B. Where we have the pupils evenly dilated. (Mydriasis). This condition is found in:—

1. Paralysis of both 3rd nerves (as after diphtheria).
2. Intra-cranial tumors (late stages).
3. Intra-cranial effusions (pressure signs).
4. Irritation of the cervical sympathetic.
5. Acute inflammation of the cervical cord or its coverings.
6. As a premonitory sign of tabes dorsalis.
7. Intestinal worms, or other irritant.
8. After epileptic fits.
10. Cataracts.
11. Amaurosis (blindness).
12. Acute mania or melancholia.
13. The use of mydriatics.

C. But again we suppose a patient with unequal pupils, then we may suspect:—

1. Tabes dorsalis.

2. General paralysis of the insane.
3. An unilateral lesion of the 3rd or sympathetic nerve.
4. Diseased tooth.
5. Pain in any branch of the 5th nerve.
6. Old iritis. Inflammation of the right or left retina.
7. Aneurism of the carotid or of the aorta or tumour of the neck of the same side (in early stages this will produce irritation mydrasis, in late stages, paralytic myosis).
8. Use of myotic, or mydriatic, in one eye.
9. An unilateral lesion of the brain.
10. A congenital condition.
11. Acute glaucoma (unilateral).

Supposing any one of the abnormalities spoken of is observed, we at once proceed to see whether the pupils will react to the stimulus of light. This is done by facing the patient to a window (if possible) covering both eyes with the hands, then removing each hand in turn. If there is no dilatation in the shade or contraction on exposure to light, the pupil is said to be immovable, or fixed.

1. The pupils are contracted and *fixed*. Then, taking up the list "A" we may exclude:—

- Uræmic poisoning.
- Meningitis and encephalitis (early stages).
- Inflammation of the retina.
- Tobacco amblyopia.
- Occupation myosis.

For in all these conditions the pupils are not fixed, the movements, although slight, may be seen.

In list "A" remains:—

- Tabes dorsalis.
- The use of myotics.
- Apoplectic effusions.
- Epileptic fits.

The contracted and fixed pupil may be present in any of these.

But the apoplectic, or epileptic, condition, and opium poisoning are usually easily recognized, so that we have only to differentiate between tabes dorsalis and the use of myotics.

The history of the cases would quickly enable us to decide, but the standard methods of examination for a case of tabes (the use of the convergence test, etc.), should be brought into use.

Summing up list "A" it may be said that contracted and fixed pupils point, in the majority of instances, to a case of tabes dorsalis.

II. But the pupils although contracted are movable. The prin-

principal use of recognizing this condition is that it enables us to be almost sure that we have not before us a case of locomotor ataxy.

III. The pupils are evenly dilated and fixed.

This is a rare condition. Looking at list "B" it may be stated that some movement of the pupils may be elicited in all the conditions named except in blindness (amaurosis) in the use of mydriatics and in complete paralysis of both 3rd nerves.

IV. The pupils are evenly dilated and *movable*. Little need be added to what was said under the last heading. Of course it should be noted that in the last stages of intra-cranial tumours and effusions no movement of the pupils can be elicited.

V. The pupils are uneven but *fixed*.

This condition almost surely points to one of two things—it is either Locomotor ataxia, or it is general paralysis of the insane. The size or shape of the pupil will not help us to differentiate between these two affections, but the history will quickly clear the matter up. Looking over the remaining portion of list "C" it may be stated that in unilateral lesions of the 3rd or the sympathetic nerves the pupil of one eye would be found to react freely; and in affections of the 5th nerve both pupils would react, but the smaller one less freely than the larger. In old iritis care must be taken, for sometimes the adhesions are so extensive as almost to bind the iris firmly down, to a large extent preventing movement. In every doubtful case, a drop of atropine solution should be used. This will solve the difficulty, for the pupil will dilate between the adhesions thus giving a notched appearance to its edge. And unless we have a case of double iritis, the pupil of the other eye will react to light. In all the remaining affections of list "C" movement would be seen in one pupil.

VI. The pupils are unequal but movable. In this condition we would probably find the cause to be a painful tooth or irritation of some branch of the 5th nerve. But the important point here is the fact that this condition of the pupils renders it unlikely that either tabes dorsalis or general paralysis is present.

Summing up the whole matter it will be noticed that, in almost every section, reference is made to locomotor ataxy. One of the most important deductions therefore is, that in every case of abnormality of the pupils (unless the cause is otherwise apparent) it is our duty to examine for locomotor ataxy. If this rule were acted upon, many of these cases would be recognized or discovered in its early stages. When we recollect that much success attends early treatment of tabes, but that little can be done, comparatively, if the case is not recognized until it has passed into the later stages, the importance of this rule becomes at once apparent.

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EDITED BY

JAMES STEWART,
A. D. BLACKADER,
G. GORDON CAMPBELL,
FRANK BULLER,
H. A. LAFLEUR,

GEO. E. ARMSTRONG
J. GEORGE ADAMI,
WILLIAM GARDNER
F. G. FINLEY,
F. J. SHEPHERD,

ANDREW MACPHAIL, MANAGING EDITOR.

WITH THE COLLABORATION OF

EDWARD ARCHIBALD,
W. L. BARLOW,
H. S. BIRKETT,
T. J. W. BURGESS,
W. G. M. BYERS,
KENNETH CAMERON,
J. C. CAMERON,

W. W. CHIPMAN,
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D. J. EVANS,
J. J. GARDNER,
A. E. GARROW,
W. F. HAMILTON,
F. A. L. LOCKHART.

C. F. MARTIN,
JOHN MCCRAE,
A. G. NICHOLLS,
E. J. SEMPLE,
J. W. STIRLING,
C. W. WILSON,

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THE COLLEGE OF PHYSICIANS AND SURGEONS AGAIN.

The proposed amendments to the statutes and by-laws, and regulations of the College of Physicians and Surgeons of the Province of Quebec, at the present time, are a matter for serious consideration. It can scarcely be urged by its worst enemies, if it has any, that the College of Physicians and Surgeons of the Province of Quebec is a lethargic and invertebrate body. It is extremely active, and its activity is exercised in the most varied channels—from a discussion of the merits or demerits of some obscure and unlicensed midwife in a remote corner of the province, to that of the most comprehensive "reform" of medical education. That its activity is sporadic—paroxysmal, would perhaps be a fitter word—can hardly be imputed to it as a fault, for its component members are mostly busy practitioners of medicine, who meet only twice yearly for two days to deliberate upon and decide questions that are of the most momentous importance to their constituents—the general medical body, and the professional schools of the pro-

vince. A few of these gentlemen are men of wide experience in matters of medical education from long connection with well established and widely known faculties of medicine; the majority are "free lances," unattached to any educational institution, but imbued with a laudable desire to do something according to their lights to further the cause of medical education in the province. It is safe to say that most of the actual work done by the board is done through the various committees,—committees on legislation, on education, on revision of by-laws, etc.,—which are chosen at the time of the meeting and hold office until the next meeting of the board, or until their labours are finished. It is also a fact that the said committees meet only at long intervals, sometimes only a day or two before the meeting at which they are to report. That such a method should lead to hasty, ill-digested conclusions is obvious. One need only look at the printed "order of the day" presented to each governor at the opening of the meeting to see that not one day, but at least one month of daily sittings would not be too much to devote to even two or three of the items on the list. But the governors are nothing if not confident of their ability to satisfactorily sift in a few hours a mass of information and detail which a university faculty would take a year to consider and adjust. And the strange thing is that these gentlemen take each other quite seriously, and adjourn in time to catch train or boat with mutual congratulations on the work done. "Ce serait à rire, si ce n'était à pleurer."

The July meeting of this year was conspicuous for the sweeping changes that were brought to the notice of the board as a whole, through the "Committee on the Revision of the Statutes, By-Laws and Regulations." The report of this committee practically includes the reports previously adopted by the committees on preliminary education and on the medical curriculum. Among the principal changes involved in this project of revision of the statutes, by-laws and regulations are, the exacting of the equivalent of a B.A. course (as understood in the French and English Catholic colleges by the term "cours classique complet"), from all candidates for admission to the study of medicine, unless they actually possess a university degree; a five-year course in medicine; the practical abrogation of the clause in its statutes granting the provincial license to holders of the British registration; and, finally, some miscellaneous tinkering with the length and arrangement of the various subjects of the medical curriculum. We have already referred in a previous number of the JOURNAL to the one-sided nature of the first mentioned change—the question of the "cours classique complet"—and have pointed out the unfairness of a scheme that legislates for the supposed benefit of one section of the candidates for admis-

sion to the study of medicine, and neglects the minority. We pointed out incidentally that the Catholic and the Protestant boards of education followed methods that were irreconcilable, one with the other, and that it was not possible to frame regulations that would apply with equal justice to those educated under two different systems. To this we have nothing to add—the objection remains unanswered, and unanswerable, under the present conditions, but the injustice is evidently about to be consummated, for there seems to be no doubt that the clause as amended (Chap. VI., clause 1), will be passed at the September meeting of the board. The amendment calling for a five instead of a four year course of medical studies is one to which no exception can reasonably be taken. It was bound to come sooner or later, in view of the present congested condition of the medical curriculum, due to the multiplication of subjects taught and the longer time demanded by the institution and extension of laboratory courses in all departments. By an unexpected gleam of wisdom the board does not definitely prescribe the scope of the fifth year work beyond suggesting that it be devoted to clinical work, laboratory and special courses. The board, however, need not take to itself great credit for this innovation. The question of a five-year course has been under serious consideration for fully three years in at least one of the provincial faculties.

The "turning down" of holders of the British license has been in the air, so to speak, for a long time. It was always more or less unwillingly, or at least with bad grace that the Provincial Board recognized this qualification. This was partly due to the fact that some of the holders of this instrument had appeared before the board at a prior meeting with inadequate credentials (diploma without "brevet," or some other irregularity), and had been "turned down," only to bob up serenely six months or a year later with the *sesame* and a "reject-me-if-you-dare" attitude. Judging, however, from casual remarks heard from time to time, and particularly from the samples of "fire-eating oratory" heard at the last two or three meetings of the board from some of its members, something more than pique underlies the proposed amendment, and there is a suspicion that the word "British" has something to do with it. We have neither time nor space to return to a detailed analysis of the changes in the medical curriculum. This is a favorite field for the display of the individual governor's eccentricities and his ignorance of what constitutes *modern* methods in medical education. The didactic lecture still reigns supreme, the number of lectures devoted to certain subjects, e.g., *materia medica* and therapeutics, is absurdly out of proportion, and some of the specialties and minor subjects come in for an undue amount of time, in compari-

son with the fundamental subjects of the curriculum. The whole thing is the work of amateurs, and a "revision" of the "revision" by a really competent committee, who took the trouble to compare the course with those of recognized educational bodies at home and abroad, would result in something vastly different and infinitely more sensible and practical. All the changes in the statutes, by-laws and regulations, above referred to, are not yet finally approved by the board, and even if approved at the September meeting, shall not be law until passed by the Provincial Legislature. May we hope that the much-abused legislators of the Province of Quebec will see more clearly into the needs of the profession and the real interests of medical education than the College of Physicians and Surgeons has done? They certainly could not do worse if they tried.

A RECENT ADVANCE IN HOSPITAL CONSTRUCTION.

During the course of his recent visit to Ireland, King Edward formally opened the new Royal Victoria Hospital in Belfast. This building presents so many novel features, more particularly in economy of space and in cost of construction and maintenance, that, when not a few hospital projects are on foot here in Montreal and elsewhere throughout the Dominion, it is worth calling attention to those features in which a distinct advance has been made. In a large portion of the Dominion climatic considerations would make servile imitation out of the question; yet, the general scheme well deserves study, nor would it, we think, be impossible to introduce such modifications into the plan as would make that plan feasible in Canada.

The ideal sought in every modern hospital is the isolation of the various departments, so that each ward dedicated to one special class of cases is completely cut off from the rest, cut off more especially as regards its ventilation, so that the air from the one does not pass into the other. Theoretically, the so-called "pavilion" system would seem to offer the easiest solution of the problem, and for a time this became, if not the popular, at least the "correct" system wherever funds would permit. St. Thomas's Hospital opposite the Houses of Parliament, in London, is well known as an early and incomplete example of the system. The Johns Hopkins Hospital exhibits (or rather exhibited), the system carried out in fullest detail. But practically the system has shown itself far from satisfactory. In the general hospital of a large city consisting of some three hundred or more beds, to follow the pavilion system and make all the wards on one floor; with, at the most a basement for ventilation and other purposes, demands so much space as to make the cost of the necessary ground practically prohibitive, if

the hospital is to be situated near the centre of the population. By this means the purity of the air in the wards tends to be more assured, and the condition of the patients correspondingly improved, but as an offset the long distance of most of the wards from the central kitchen too often results in the food being served to the patients in a lukewarm condition, and, as a consequence, unsatisfied appetite neutralises the benefit of an improved hygiene. In a northerly climate also, each ward being distinct, with the bed heads between the windows, the cost of heating so many detached buildings would be enormous, and along the outer wall of the pavilion, unless special precaution be taken and a proper and expensive system of air spaces be constructed in the outer walls, of necessity, through the cooling of these outer walls, there would be frequent complaint of a down-draught of cold air blowing upon the heads of the patients. In hospitals in much lower latitudes than ours it is customary for a space of from two to three feet to be left between the outer wall and the head of the bed, a space which either seriously reduces the breadth and usefulness of the central aisle, or demands that still greater expense be incurred by making the wards some five or six feet broader than would otherwise be necessary. Over and above all, the system is expensive, not merely in land, but in cost of construction and of administration. For a general hospital it is found generally impracticable.

As a result of these disabilities a modification of the pavilion system is commonly adopted; to economize space there is only a partial isolation of the wards. Blocks of more than one story are made to include all surgical and medical wards respectively, while the administration and kitchens, are housed in a separate central block. The Royal Victoria Hospital in Montreal is a good example of this modification of the system.

For this modification to be successful, great care has to be taken with the ventilation, and some method of either driving in or sucking out the air from the various wards has to be devised; devised in such a way that each ward can be treated as a separate unit for ventilation and so walled off from the rest that the vitiated air from the lower ward for example, does not escape into the passage ways and so find its way into the wards on another floor. The system of ventilation found most satisfactory at the present time is that known as the 'plenum system.' In this the air is first sucked in by large fans through a moist screen which purifies it, is then heated to the desired temperature and next forced by other fans into a series of passages leading to the various wards, so that the air enters these wards under a certain amount of pressure, and according to the size of the channel and the opening into the wards, according also to the size of the exits from the ward, so is

there afforded the requisite renewal of the air in the wards. At Birmingham, Liverpool, and other large new hospitals in England, this system has been found to afford very considerable satisfaction and, under a more or less modified form, it is employed extensively on this continent. It is, however, found difficult to exactly graduate the pressure and the size of the channels leading to the wards situated on various levels. It is most successful where all are on the one floor. It has to be admitted also that by this block method the expense of building, while reduced, is still considerable, and a large amount of outside wall and window space is apt to cause considerable diurnal variation in the temperature of the wards, requiring constant care of the heat regulation. But the temperature can be properly regulated even in a climate having such considerable variations as our own, as has been abundantly demonstrated in the Montreal hospitals; nevertheless, the regulation is a matter of constant attention. Carrying out the plan first recommended by their architect, Mr. Henman, in the *Builder* of

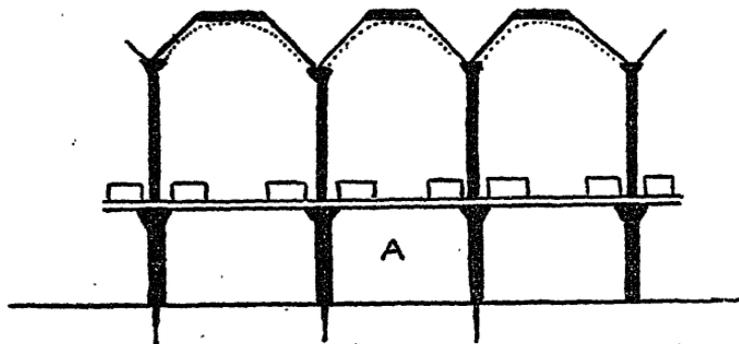


FIG. I.

Transverse vertical section through series of wards to show method of lighting from above. The basement A is utilised to carry the ventilating shafts and heating apparatus.

August, 1896, by what seems to be a wonderfully simple scheme, the builders of the Belfast hospital have overcome most of these difficulties. They have accepted, what for purposes of ventilation is the most important feature of the pavilion system, and have placed all their wards upon one floor; but, instead of making each a separate building, they have placed them side by side so that each side wall serves to support the roof of two wards. This, of course, does away with windows between the beds. These they replace by a row of sloping side lights in the roof, some twelve feet or more above the floor. The outer ends of the wards are practically all window space, beyond which is a balcony and sun parlour. The result is that the wards are bright and cheerful, and also that the downward current of air upon the heads of the patients is almost entirely done away with. We have here roughly sketched these

main features of the scheme. It will be immediately obvious how materially this reduces the cost of construction; as a matter of fact, they have built and equipped, in Belfast, and built well, a hospital with three hundred beds at a cost of £100,000. Thus the main features of the building are (1) that all the wards are upon one floor and built side by side on the south of one long main corridor (2) the lighting of the wards and corridors is provided by roof windows or lanterns; (3) ventilation is by the "plenum" system, each ward is for practical purposes air-tight, so that the air from one cannot pass into the others; (4) the

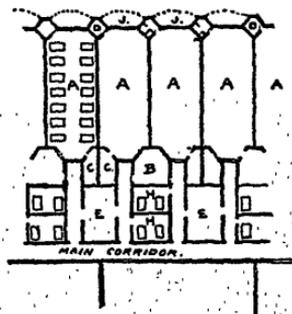


FIG. II.

- A., A., A., Wards each containing 14 beds.
 B. Ward kitchen serving 2 adjoining wards with windows overlooking each.
 C., C., Bath rooms, one for each ward.
 D., D., Sanitary Tower, one to each ward.
 E., E., Operating room or clinical theatre.
 H., H., Wards with two beds, one such ward connected with each larger ward.
 J. Balcony.

wards with their accessories are on the "unit" system, each physician or surgeon having a unit, or small hospital, to himself. From the main corridor, 460 feet long, 17 side passages lead south to the seventeen wards. We reproduce the main features of this plan. We may here note that for every pair of wards there is a common kitchen and a separate operating room, class room or clinical theatre, according to the nature of the cases treated in those wards. North of this main corridor are separate blocks for administration, out-patient department, and ophthalmic departments, while the pathological department, the septic and infectious wards, the laundry and engine rooms are in separate buildings.

Altogether this plan seems well worthy of consideration and capable of being applied, not merely for general hospitals but, with complete closure of the main corridor between the separate departments, for the purposes of an infectious hospital. One great difficulty in this climate would be in connection with the roof windows, but it is not very difficult to suggest a method of arranging these whereby they would not become obstructed by snow.

MUNICIPAL SANATORIA FOR CONSUMPTIVES.

At the last meeting of the Canadian Medical Association a resolution was introduced by Dr. E. J. Barrick, seconded by Dr. R. W. Powell, and unanimously agreed to, urging such local action in regard to Municipal Sanatoria for consumptives as would entitle them to governmental aid. The province of Ontario is well advanced in this necessary work. On the 5th of April, 1900, the legislature of that province adopted a bill, which may well be the model for future legislation. The government offered assistance to the municipalities to the extent of one-fifth of the cost of land and buildings, and \$1.50 per week for each patient. The legislation was very elastic, and the municipalities were permitted to surround their by-laws with such conditions and restrictions, as would best serve to secure the confidence of the ratepayers.

This great problem of the eradication of tuberculosis is of equal importance with the education of the people, the administration of justice, and is one with the question of the preservation of the public health. No attempt is made to assemble all pupils in one public school, to collect offenders against the law in a single house of detention, or to isolate all infected patients in a central hospital. Similarly, the method for dealing with persons suffering from tuberculosis is to segregate them in municipal institutions, and any scheme which does not take full account of the poor is not worth considering. There are two methods open, the mandatory and the permissive. It may be said at once, in view of the present state of public feeling, that compulsion upon municipalities to establish sanatoria, or upon patients to enter them would not be tolerated.

The first municipality to attempt to avail itself of the provisions of the law was Toronto, and the matter went so far, that the ballots had been printed, when an injunction was granted by Judge Britton restraining the Council from taking the vote. It is gratifying, however, to note that the Act was amended last session making it legal to submit this question at the ensuing municipal elections. Under the by-law, which it was proposed to submit, the city was to be at no expense in connection with the sanatorium beyond the \$50,000 to be granted, and the payment of \$2.80 per week for each patient sent to it. The sanatorium was to be exclusively for residents of Toronto; it was to be within twelve miles of the city, with 50 to 100 acres of suitable land; to consist of an administration building, cottages and tents, to accommodate patients who had been residents of the city continuously for at least two years immediately prior to their admission, and was to be open to consumptives in all conditions of life and in all stages of the disease.

It was not to be a free sanatorium, as such would encourage pauperism, but those able to pay should pay, and the poor should be treated free of charge. The Board of Trustees was to consist of the Medical health officer and eight other persons appointed by the Council, four of whom should be nominated by the voluntary contributors.

The proposed plan would practically work out as follows: Government grant \$1,000; Civic assessment \$50,000; Contributions \$50,000. For maintenance the government would grant \$1.50 per week, the municipality \$2.80, and other contributions would come from patients, churches, lodges and other organizations. It is a notable achievement to have passed such a law. In Canada, 8,000 persons die every year of tuberculosis, and it has been proved that this mortality can be decreased twenty per cent. every five years. Beyond this, a municipal sanatorium in each county would be an important local educator, and as the mind of the public became seized of its importance, patients would more readily be persuaded to take advantage of a local institution, where they would not necessarily pass out of the care of their own physician, and out of the reach of their friends, where their chances of cure or improvement would be greatly increased, and the spread of the disease to their friends and the public generally would be materially checked.

We have not progressed this far in Quebec, but with the stimulation of the anti-tuberculosis league, an advance is sure to be made.

THE INTRODUCTORY LECTURE.

The session of the two medical colleges opened without the customary introductory lecture. If the omission were made after deliberation, there is nothing to be said, for a faculty is the sum of all wisdom; if it arose from neglect and want of thought, or from paucity of ideas, then the thing is a matter of regret. An introductory lecture is an occasion for the gravest utterance, and one that should not be lightly set aside. It affords an opportunity for welcoming the new comers into the university life, of impressing upon them the seriousness of the undertaking upon which they are embarked, and setting before them the ideals by which they should be actuated. The minds of the Freshmen are in a peculiarly susceptible condition, and lessons of sobriety, self-restraint, and kindness, as set forth in an introductory lecture from some one high in position, would find an abundant entrance. It is the one occasion on which students of any year will willingly endure being preached to; physicians are not always the worst preachers, nor students of medicine the least in need of that salutary exercise.

The university sermon has been abandoned long ago, and it looks as if the introductory lecture were to follow it into oblivion, yet an hour

would not be misspent, either by students or by teachers, in listening to counsel in favour of diligence, humility, quietness and industrious peaceable living, and remonstrance against idleness, on the one hand, or self-absorption and too hard work on the other, which last is after all the least harmful form of vice. We hasten to add that the editors of this Journal are not taking it upon themselves to supply the omission.

The term "proprietary preparation" is habitually employed in this JOURNAL in its exact and specific sense. It is intended to describe a preparation which is proprietary. Some preparations are reliable and some are not. According to the official bulletins of the Canadian Government, most of the preparations sold by druggists are not reliable, and this observation applies to such standard articles as tincture of opium, tincture of belladonna, nitrous spirits of ether, etc. If a physician thinks that a preparation of opium, manufactured by a certain firm, is better than any other, he may prescribe that it be drawn from the stock manufactured by that firm, and in such a case we understand that he demands a preparation of opium of which that firm is the proprietor. The term "proprietary" does not indicate whether the preparation is good or bad, whether its composition is secret or well-known. If we have to specify a preparation of which the ingredients are unknown, we refer to it as a "secret proprietary preparation," as a nostrum," or any such term as comes to hand. We are quite well aware that the term "proprietary" is sometimes employed to indicate secret preparations alone. Such a restriction is incorrect. It is not so employed in this JOURNAL.

A practice which is common enough in England has not yet obtained any great favour here, that is the laudation in the public press by patients of their physician's services. It is taken for granted here, that if a man falls ill, he seeks proper advice, that he will be wisely counselled and recommended to enter a hospital, if the nature of his case demand that method of treatment, and that finally he will be humanely cared for whilst he remains in the institution. Physicians in this country are content when they have followed out that routine; if the patient pay his bill and have gratitude in his heart, the physician is still content: if the patient express that gratitude discreetly and privately the physician will make nothing more than feeble protestation, but when the patient embodies his sentiments in a letter to the newspapers, he is revealing himself, and causing chagrin to his adviser. Mr. Alfred Wraith, delegate from the Osett Chamber of Commerce, Yorkshire,

England, appears not to have been advised of this peculiarity of ours. He wrote such a letter and had it published.

The Women's Christian Association have taken a hand in the anti-tuberculosis campaign, and waited upon the Mayor, to urge that placards be exposed against the practice of spitting on the sidewalks. This is the first occasion on which the statistical method has been applied to the practice of expectoration. One lady discovered on Bleury street in the space of four blocks 193 "new expectorations," and the same afternoon the number was 194. The half dry expectorations were rigidly excluded from the enquiry, though no standard of dessication was mentioned, but there was good evidence that they would have numbered as many more, giving a total for the day of 774. Something must surely be done, but in the meantime the Mayor, who had himself probably come to his office by Bleury street that morning, might have taken the opportunity to urge the ladies to use their influence in the direction of inducing women to cut a piece off the bottom of their skirts, and so remove one of the most disgusting effects of the practice of expectoration.

The Medical Journals in the Middle and Western States are reproducing a correspondence which a New York physician had with the *Evening Post* and the *Mail and Express* on the subject of the introduction of leprosy into the United States through the medium of Asiatic immigration. This writer acknowledges that he had taken the unusual course of writing to the Governor-General of Canada, protesting against the menace to the United States that was found in the lazaretto at Tracadie, and one or two other places. From these isolated leper colonies he infers that Canada has "let down the bars" to Asiatic invasion and is thereby becoming infected with leprosy. There is a worse malady than leprosy, and that is bearing false witness.

A movement is on foot for the amalgamation of the two Ottawa organizations of physicians and surgeons, the Ottawa Medical Society and the Ottawa Clinical Society. The Ottawa Medical Society is made up of the doctors connected with St. Luke's Hospital, and the General Hospital, Water street. The Clinical Society is composed mainly of the doctors of the staff of the Protestant Hospital. A few years ago, it will be remembered, there was some misunderstanding among the staff of the Protestant hospital and the rupture culminated in the movement for the erection of St. Luke's Hospital. Inasmuch as both societies perform identically the same work and have one common aim, all persons interested will be benefited materially by the projected amalgamation.

Reviews and Notices of Books.

A MANUAL OF OBSTETRICS. By A. F. A. KING, A.M., M.D., Professor of Obstetrics and Diseases of Women and Children in the Medical Department of the Columbian University, Washington, D.C., and in the University of Vermont, etc. Ninth edition, revised and enlarged. Lea Brothers & Co., 1903.

The mere fact that a manual for students has reached its 9th edition, proves that it must be popular; but whether the general use of such books is really helpful to the student or not, is quite another question. If used as a means of refreshing the memory, of giving method or system to his reading, or as an aid in revising his work, it may be of service; but if the student crams up from such a book for examination or relies upon it as containing all that it is essential for him to know for the practice of his profession, he will make a sad mistake. As a matter of fact he will receive from it many false ideas and impressions respecting modern methods of practice. For example, many of the obstetric instruments, such as forceps, perforators and cranioclasts are figured with the old fashioned checked wooden handles; in the cuts illustrating vaginal examination, relaxation of the perineum during labour, extraction of the head in breech cases, the use of the filet, blunt hook, forceps and perforator, the operation of podalic version, bimanual ante flexion of the uterus for the arrest of p. p. hæmorrhage, etc., the operator's arm is shown covered with shirt sleeves, cuffs and coat sleeves. The man who imitates such technique and uses such instruments of doubtful cleanliness is not adopting modern antiseptic methods and can not expect to obtain the best results. While, on the whole, the text is clear and concise, there are many important omissions; for example in the description of the implantation of the fertilized ovum in the uterus, there is no mention of the modern theory of imbedding, and in the description of *accouchement forcé* no reference is made to the use of Bossi's dilator, and the method of bimanual dilatation of the os which is figured is not the quickest, safest or best. These are a few of the defects of the book; on the other hand, it is concise, clear and readable and at the end has a useful chapter upon the jurisprudence of midwifery. In most of the larger books it is a serious omission that some information is not given upon such an important subject. On the whole this book may be helpful to students if used properly, and not made to replace altogether larger and more complete works, and especially if read along with careful notes of a systematic course of lectures.

A THESAURUS OF MEDICAL WORDS AND PHRASES. By WILFRED M. BARTON, M.D., Assistant to Professor of Materia Medica and Therapeutics, Georgetown University, Washington, and WALTER A. WELLS, M.D., Demonstrator of Laryngology and Rhinology, Georgetown University, Washington; octavo, 534 pages. W. B. Saunders & Company, 1903. Flexible leather, \$2.50 net. Canadian Agents : J. A. Carveth & Co., Toronto.

This book is of doubtful utility, inasmuch as it is likely to accomplish the end which the editors acknowledge in the preface they had in view, "to find a certain technical term to express an idea which had temporarily escaped our minds, *and which*." That is the vice of most medical writing, the substitution of technical terms for ideas and it is one which requires no encouragement. It would be better, one would think to wait patiently until the idea came back. If the editors had so waited, they would not have employed the term "categorematic" in the preface, a word, the meaning of which none but dictionary makers, reviewers of books, and other infallible persons are likely to know. The editors point out the value of the book to novelists, requiring the employment of technical medical terms as if it were desirable to encourage them still further in writing about what they do not understand. We say again it is a questionable service to reveal to writers that they may employ such terms as keraunophobia, bromidrosiphobia, siderodromophobia to express fear of lightning, of bodily odours and of railroads. One must wonder who has created these words; they might have been of service to a Roman journalist of the third century; to one who aspires to write in English they are of none.

THE PRINCIPLES OF OBSTETRICS, a Practical Manual for the Student and General Practitioner. By STANLEY PERKINS WARREN, M.D., Portland, Me., Obstetric Surgeon to the Maine General Hospital; octavo, 385 pages; illustrated by 165 line and half-tone engravings. Cloth, \$3.00 net; leather, \$3.75 net. William Wood & Company, Publishers, New York.

This work designs to teach that aseptic midwifery is possible under the restrictions of the private home, and the author trusts that it will be found to be "a working hand-book adapted to the requirements of private practice, where the refinements of hospital instrumentation and nursing are conspicuously absent." The author has turned out a very acceptable little manual; the subject is presented in a simple, almost elementary form, and is well adapted to the needs of the primary student. The general practitioner also will find, many valuable hints of a very practical character scattered throughout the work. The chapters

on the diagnosis of pregnancy, the conduct of labor, and infant feeding are excellent and the best in the book. The statement on page 90 that: "In multiparæ urinalysis may ordinarily be deferred until symptoms of kidney insufficiency appear," is certainly open to criticism. It is also to be regretted that in dealing with the subject of asphyxia of the new-born, a description of the Sylvester method of treatment has been omitted. This method is also omitted in Whitridge William's recent book. The work of the publishers is up to the usual high standard associated with this house in the minds of the medical public.

D. J. E.

A TEXT BOOK OF PATHOLOGY. By ALFRED STENGEL, M.D., Professor of Clinical Medicine, University of Pennsylvania; fourth edition. W. B. Saunders & Co., Philadelphia, 1903. Canadian Agents: J. A. Carveth & Co., Toronto.

The history of this work is interesting. It was first issued in 1898; it was revised and reprinted in March, 1899, again reprinted in August, and also in November of that year. It was revised in October, 1900, reprinted in July, 1901, and September, 1902, and now appears as a fourth edition. Stengel's book occupies a place in pathology similar to that which Osler's holds in medicine. It has grown to 933 pages, an increase of 60 pages over the previous edition. The changes are found chiefly in the sections dealing with general pathology, and the subjects that have received most attention are the theories of immunity, inflammation, the bacterial diseases and abnormal conditions of the blood. A chapter has been added upon the technique of pathological methods, or as Dr. Stengel writes it, "the technic of pathologic methods," and the illustration has been amended and increased. While this rapid reissue of books attests to their popularity, it makes one despair of acquiring a medical library which shall be of permanent value. A new edition to some extent destroys the value of the previous one, and one hesitates in buying a book which is sure to be superseded in a year or two. Dr. Stengel's work has frequently been mentioned in this Journal, and the present revision keeps it, as it has always been, one of the most authentic and satisfactory for all purposes, that is accessible to the student, the practitioner, or the pathologist.

A TEXT BOOK UPON THE PATHOGENIC BACTERIA. By JOSEPH MCFARLAND, M.D., Professor of Pathology and Bacteriology, Medical-Chirurgical College, Philadelphia. Fourth edition. W. B. Saunders & Co., Philadelphia, 1903.

Since 1896, this book has gone through four editions, and has grown from 359 to 629 pages. The alterations to be noted in this edition are

an extension of the chapters on infection and immunity, the introduction of references to the literature of bacteriology, an index of authors and an amplification of the descriptions of technique. The book is not to be mistaken for a general treatise upon bacteria; it deals only, but very fully, with those forms which under ordinary circumstances are pathogenic and has thereby a definite usefulness to those whose business it is to deal with disease. Dr. McFarland writes with a good style and a reading of his book is pleasing besides being informing. One follows his argument with a sense of security.

DISEASES OF THE EAR. A Text Book for Practitioners and Students of Medicine. By EDWARD BRADFORD DENON, M.D., Professor of Diseases of the Ear, University and Bellevue Hospital Medical College, third edition, revised and enlarged; with 15 plates, 158 illustrations. D. Appleton & Co., 1903.

A handsome, well printed, and well illustrated volume. Otology as a whole is treated in a thoroughly modern manner, but the work is to be specially commended for the comprehensive and lucid chapters on the examination of the ear and aural operations. In treating clearly and fully in this third edition the latest developments of operative ear work, the author has supplied a want in English otological literature.

W. G. M. B.

THE PRACTICAL MEDICINE SERIES OF YEAR BOOKS, comprising 10 volumes, issued monthly, edited by GUSTAVUS P. HEAD, M.D., Vol. VIII., *Materia Medica and Therapeutics and Forensic Medicine*, by George F. Butler, Henry B. Favill, Norman Bridge, Daniel Brower and Harold A. Moyer, July, 1903. The Year Book Publishers, Chicago.

Frequent mention has been made of this series. It continues to be good and moderate in price.

Medical News.

McGILL UNIVERSITY.

The formal opening of the University for the year 1903-1904 took place on the 22nd September. The Principal assembled the students of Arts and Science in the Molson hall, where they met the members of the faculty, including those teachers who were appointed since the close of last session, namely: Professors Nobbs, in Architecture; Harkness, in Mathematics; MacNaughton, in Classics; Caldwell, in Ethics; Taylor in Logic, and Professor Moyses, the new Dean of the faculty of Arts.

The Principal welcomed the students cordially; he expressed the hope, that at some future time they would have a hall of residence, he expressed satisfaction at the high status, to which the faculty of Arts had attained as a result of the reorganization of the curriculum, and the additions to the staff. He referred to the high encomiums he had heard upon the University, whilst he was abroad, and concluded by asking the students to remember, that though it was difficult for him to know them all personally, they were, at all times welcome to come to him for any purpose which they might have in mind.

McGILL MEDICAL COLLEGE.

The seventy-second annual session of the McGill Medical Faculty opened on the 22nd September, and lectures began the following day, to continue till 21st May, 1904, when the annual examinations will commence. The changes in the staff and in the curriculum have already been noted. The register is still open, and no accurate knowledge of the members to be in attendance can be obtained until it closes. Up to the present considerably over three hundred have registered and everything promises well for a successful year.

BISHOP'S COLLEGE.

The thirty-third annual session of the Medical Faculty of the University of Bishop's College opened on Tuesday, 15th September, and will continue till the 28th of May, the usual Christmas holidays intervening. The opening is a month earlier than last year, and for that reason the members in attendance are rather smaller than usual, but from information obtained from the Registrar it would appear that the prospects for an increased attendance are good. The Dean is making rapid progress towards recovery from his recent unfortunate accident.

LAVAL UNIVERSITY.

Laval University will reopen on the 6th October, with no special change in the teaching staff for the present, at least. The curriculum of studies will undergo some modification, in regard to Morbid Anatomy and Bacteriology, but final changes will not be announced till after the 5th of October.

THE MATRICULATION IN MEDICINE.

For the information of the older graduates, who may be interested to know what medical students have to endure, a few of the questions set at the recent examination for matriculation, are reproduced:—

Discuss the qualities of Tennyson's poetry illustrated by the following poems : Dora; Recollections of the Arabian Nights; The Revenge.

Parse the words in italics in the following sentence:—

But thou, that didst appear so fair
To fond imagination,
Dost rival in the light of day
Her delicate creation.

The adjacent sides of a rectangle are $8\frac{1}{2}$ and $13\frac{1}{2}$ inches. Find in centimetres one side of a square which has the same area as the rectangle. [The above question is now called "arithmetic." Ed.]

Explain how a bicycle rider recovers his balance by turning towards the side on which he is falling. [The above is "physics." Ed.]

If a straight line touch a circle, and from the point of contact a chord be drawn, the angles which this chord makes with the tangent shall be equal to the angles in the alternate segments of the circle. [This, of course, is geometry. Ed.]

Write down the fut. indic. of sum, pres. subj. act. of moneo, imperative act. of audis, all the participles of hortor, gerund and gerundive of rego.

Translate, explaining fully the construction of italicized words : Huius cum sententiam plurimi *essent secuti*, Militades non dubitans tam *nullis consciis* ad regis aures consilia sua perventura, Chersonesum reliquit ac rursus *Athenas* demigravit. cuius ratio etsi non valuit, tamen magno opere est laudanda. cum amicior omnium libertati quam suae fuerit dominationi.

Old graduates are reminded that "j" is now written "i," also note the subtlety of the punctuation. Ed.]

Given the 1st sing. of present and imperfect, and
gen. verstlien, thun, gefallen, nehmen, reden, bitten, beten,
 the past participle of *richten, lassen, gehen, fragen, tra-*

[Graduates will note amongst other things the clever transposition of the second and third lines to preserve the German feeling. Ed.]

MEDICO-CHIRURGICAL SOCIETY.

The first Council meeting of the Montreal Medico-Chirurgical Society was held on Friday evening, 25th September, the President, Dr. Birkett, presiding. The reports of the secretary and chairman of the committees were received, and many matters taken into consideration, which the Council hope will tend to make the meetings of the Society even more interesting and efficient than in the past. The first meeting of the Society will be held on the 2nd October.

LA SOCIÉTÉ MÉDICALE.

This society, which is attended by most of the French speaking members of the profession, will resume its regular work on the first Tuesday in October, and will continue thereafter on the first and third Tuesdays of each month. The first meeting will open with the election of the officers for the current year. A special meeting, however, was held on 24th September, to consider a motion passed by the Shefford County Medical Association, dealing with a lessening of the number of governors on the Provincial Medical Board.

MONTREAL GENERAL HOSPITAL.

The last quarterly report of the Montreal General Hospital, shows that 813 patients had been treated in the wards with 67 deaths, 26 of which occurred within three days after admission, making the ordinary mortality 5 per cent. The total number of hospital days was 16,177 with an average detention per patient of 19.9 days. In the outdoor department there were 8,651 consultations, an increase of 543 over the corresponding quarter of the previous year. During the three months the ambulance responded to 383 calls, an increase of 103 over the corresponding period of last year.

The ordinary income for the quarter was \$16,054.44, as against \$18,501.08 for the corresponding quarter of 1902, being a decrease of \$2,446.64. This decrease came about by a falling off in the annual subscriptions of \$1,430, and ordinary donations of \$1,226. The expenditure for the quarter was \$24,916.78, as against \$23,837.63 for the corresponding three months of 1902, showing an increase of \$1,079.15, chiefly in salaries and wages. Legacies without conditions were received from the following estates: The late Miss Catherine Wurtele, \$8,000; M. Wurtele, \$8,000; Annabella Leith, \$500; Miss Cameron, \$25, and the late Mr. John Crawford, \$900.

The typhoid fever cases continue to increase and on the 15th September, there were 34 patients in the wards.

THE ALEXANDRA HOSPITAL.

The new hospital for infectious diseases has been advanced another stage. The committee has purchased a plot of ground comprising a space of about 160,000 square feet in Point St. Charles, near the revetment wall, the exact location being between Charron street and Ash avenue. The committee is satisfied that the property is in every way suitable and the price reasonable. Several architects have been asked to submit plans for the erection of a complete infectious hospital of four pavilions to accommodate 100 patients.

HOTEL DIEU.

During the month of August 2,117 out-patients and 603 in-patients were treated at the Hotel Dieu. Of these 1,117 were treated in the eye, ear, nose and throat department. The present house staff consists of Dr. Bourgeois, as head house surgeon, and Drs. Ludovic Verner, J. R. Hamelin, G. E. Bedard, Henri Prevost and Eugene Latreille.

NOTRE DAME HOSPITAL.

During the month of August 2,024 patients were treated in the Outdoor department and 225 in the wards. The house surgeon's staff is still headed by Dr. Fleury; the staff is five in number, of whom Drs. E. David and Joseph Rousseau are the recent additions.

DISTRICT OF ST. FRANCIS MEDICAL ASSOCIATION.

The district of St. Francis Medical Association met in Sherbrooke September 9th, with Dr. W. D. Smith presiding.

At a meeting of this Association held last May, Dr. Russell Thomas, of Lennoxville, gave notice that at this meeting he would move "that the association regrets that Dr. Pelletier, one of its members, should have voted in the Quebec Legislature against Dr. Roddick's Bill for Dominion Registration."

Previous to the last meeting of the Canadian Medical Association at Winnipeg, the District of St. Francis Medical Association elected Dr. Thomas its special delegate to that meeting, instructing him to support Dr. Roddick's bill. Dr. Thomas considered Dr. Pelletier under the circumstances should not have voted against the bill, and moved the above motion, notice of which he had given last May.

Dr. Pelletier in reply said he considered he was more responsible to his constituents in the matter than to the association; that while he agreed with the principles of the bill, he objected to some of its terms, and consequently voted against it, as he thought he had a perfect right to do, particularly as he had not been present at the meeting which elected and instructed Dr. Thomas. Dr. Thomas then withdrew his motion.

A resolution passed before the Shefford Medical Association, advocating a reduction in the number of governors in the College of Physicians and Surgeons from 43 to 25, was submitted for consideration. Dr. Beique moved in amendment, that the Board of Governors be reduced from 43 to 25, and, in consequence that one representative be chosen.

from each university instead of two. A vote was taken and the amendment was carried by a majority of seven.

The following officers were elected :—

President: L. C. Bachand, Sherbrooke; 1st vice-president, J. McCabe, Windsor Mills; 2nd vice-president: A. G. Beique, Magog; secretary: F. A. Gadbois, Sherbrooke; assistant secretary: E. J. Williams, Sherbrooke; Council: W. A. Farwell, F. J. Austin, Dr. Camirand.

ASSOCIATION OF HEALTH OFFICERS.

The eighteenth meeting of the Association of executive health officers of Ontario was opened at Peterboro on the 9th September. The President, Mr. Thomas MacFarlane, Ottawa, occupied the chair, and there were in attendance Dr. Bryce, Secretary provincial board of health; Dr. Lane, Mallorytown; Dr. Bingham, Medical health officer, Peterboro; Dr. McNulty; Dr. Klotz, Ottawa; Dr. Oldright and Dr. Hodgetts, Toronto; Mr. J. W. Bowlby, Brantford; Wm. Skinner, B. C. McBride, R. A. Carruthers, Dr. Hutchinson and Charles Taylor, London; Dr. Hall, Chatham; Dr. J. F. Fraser, Medical health officer, Lakefield; Dr. McCrimmon, Claremont; Dr. Pearson, Brantford; Dr. Boucher, Peterboro, member of the provincial board of health; Dr. Greer, Dr. Caldwell, Dr. McGrath and Dr. Halliday.

Dr. Bryce, in the absence of the writer read the paper of Prof. W. T. Connell, Kingston, upon the subject of water-born epidemics of typhoid fever. Details were given of an outbreak of typhoid and diarrhoea last February, traceable to a break in the intake pipe of the city waterworks, the epidemic ceasing with the repair of the pipe.

Dr. McNulty, Peterboro, read a paper upon the etiology and suppression of typhoid epidemics.

Dr. Oldright read a paper on vaccination in relation to public health, and showed that public opinion must be educated to sustain governments in enforcing vaccination. Dr. Bingham also gave a short address on vaccination as a preventative of smallpox.

Dr. Shaw, Medical health officer of Keene, read a paper on County Medical health officers.

Dr. Klotz of Ottawa, gave a paper on serums in their relations to diphtheria and scarlatina.

The paper of Dr. Robert Law, Medical health officer of Ottawa, dealt with the question of the relation of hospitals to the spread of infectious disease.

Dr. Bryce, Secretary of the provincial board of health, spoke of the importance of the place of isolation hospitals in the suppression of disease.

The President and Council of the University of Toronto, have issued invitations to be present at the inauguration of the new buildings for physiology, pathology and medicine, on Thursday, October 1st.

Dr. Frank C. Fraser, died at his father's residence, University street, Montreal, on the 26th August. Dr. Fraser was a graduate of McGill in Arts, and Medicine of the class of '98 and was house surgeon in the Royal Victoria Hospital. The cause of death was tuberculosis.

Tenders have been issued by the department of marine and fisheries for the erection of a marine hospital at Louisbourg. The new building will be of wood, and will be sixty-five feet long, forty feet wide, and three stories high. Owing to the increase of shipping at Louisbourg the need of a marine hospital has been greatly felt.

The Brandon General Hospital is making good progress. The new building, the foundation of which is already completed, will lie to the west of the old building, it will be 36 by 89 feet, of stone and brick and will have two stories and a basement, it will contain thirty-two beds, and will cost \$25,000. A portion of the ground floor will be devoted to maternity cases, and the remainder of the first and all of the second will be for surgical work.

The half-yearly examinations of the Nova Scotia Medical Board were completed on the 9th September. Of the seven candidates for license, five were successful; Edwin Egbert Dickey, Dalhousie, '03; Cyprus Decker Lloyd, Tufts', '98; W. T. Morris, Toronto, '03; S. C. Morris, McGill, '03; C. W. O'Brien, McGill, '03; W. N. Rehfusse, McGill, '03. The examiners were Drs. J. W. MacKay, N. E. MacKay, N. F. Cunningham, A. J. Cowie, M. A. Curry, D. MacIntosh, A. P. Reid and E. V. Hogan.

The opponents of the federation of Toronto and Trinity universities have had recourse to the law, and obtained an injunction restraining the committee from presenting their report, the corporation from adopting it, and the bishops from approving it. The plaintiffs in the action are Dr. Wm. Natrass, a medical graduate, Rev. T. W. Powell, a divinity student and Rev. John Langtry, a graduate, who sue on behalf of all students and graduates. The defendants are the bishops and Provost Macklem, J. A. Worrell, K.C., Edward Martin, the committee appointed by Trinity corporation to negotiate federation with a similar com-

mittee from Toronto University. Whatever the outcome of the proceedings may be, the best information is that it will not affect the arrangement between the two medical faculties.

Dr. Wilfrid L. Taylor, McGill, '01, died at Waterloo.

Dr. W. E. Montgomery died at Gorrie, Ont., 8th Sept., of phthisis.

Dr. Armand Hudon, Montreal, died 1st September, after an illness of three days.

Dr. R. Bruce Shaw, Charlottetown, a graduate of McGill, and at one time house-surgeon, Royal Victoria Hospital, died in Boston.

Retrospect of Current Literature.

SURGERY:

UNDER THE CHARGE OF GEORGE E. ARMSTRONG.

The Age for Operating on Cleft Palate.

R. W. MURRAY, F.R.C.S., Eng. "The Age for Operating on Cleft Palate." *British Medical Journal*, August 29th, 1903.

When the cleft involves either the soft palate alone or both the soft and hard, about the end of the second year is advocated as being the best time to operate. In cases of hare-lip not associated with cleft palate, Mr. Murray operates between the third and fourth week, when the two coexist, the lip is treated first, the palate afterwards at the given ages.

If the defect is limited to the lip or soft palate the prognosis for perfect articulation is good, but when the cleft involves the alveolar border, or hard palate, no matter at what age the operation is done, the result obtained is not as favourable, as defect in these structures is associated with imperfect development in the nasal chambers and these play a very important part in articulation.

Closure of the cleft before the child learns to speak gives the best result, while operation in earlier infancy is more difficult, the tissues are friable, and amount of flaps obtainable very much less, with the result that the soft palate is made smaller and is not movable, two factors regarded by the writer as essential for proper articulation.

Intussusception of the Vermiform Appendix.

F. POWELL CONNER, F.R.C.S., Eng. "Intussusception of the Vermiform Appendix." *Lancet*, August 29th, 1903.

This rare condition was rendered more interesting by the unique

fact that the appendix itself formed the apex of the intussusception. The etiological factor was a blow upon the abdomen producing a primary appendiculo-cæcal intussusception followed by a more extensive ileo-cæcal invagination.

The Surgery of the Ureter for Impacted Calculus and some other Causes of Obstruction.

P. F. FREYER, M.A., M.D. "The Surgery of the Ureter for Impacted Calculus and some Other Causes of Obstruction." *Lancet*, August 29th, 1903.

The report is based upon ten cases of ureteral calculus, all of which were successfully operated upon. The great difficulty of making a positive diagnosis of ureteral calculus, except when the impaction is at the vesical end is reviewed, and the aid derived from a cystoscopic examination of the bladder, especially when the stone is low down, emphasized. In eight cases the impaction was at the lower end, and in two of these the stone could be seen at the vesical orifice. In the remaining two it was situated between two and four inches from the pelvis of the kidney. The ordinary oblique lumbar incision, prolonged parallel to Poupart's ligament if necessary, and extraperitoneal route is advocated as being freer from the dangers attending the intraperitoneal method and giving all the necessary access to the ureter throughout its whole course. Closure of the ureteral wound by sutures is considered "neither necessary nor advisable when the stone is removed by an extra peritoneal operation." Other causes of ureteral obstruction are given, and a case of movable kidney producing kinking of the ureter with resulting hydronephrosis and associated with stricture due to periureteral adhesions, successfully operated upon, is included in the report.

Prostatic Hypertrophy and its Radical Cure.

WILLIAM POST HERRICK. "Prostatic Hypertrophy and its Radical Cure." *Medical Record*, August 15th, 1903.

The surgical anatomy, etiology, pathology, symptoms, diagnosis, and treatment are reviewed. The treatment is palliative and radical. Although palliative measures may relieve they can never cure the disease, and since the condition is a progressive one prostatectomy is advocated, as in such cases radical or curative treatment is often, in the long run, the most conservative plan. The perineal route is the one selected because it is more direct, the prostate more easily reached, and enucleated with less damage to the prostatic urethra and neck of the bladder, dependent drainage secured, and the operation attended by the lowest mortality rate and best curative results.

When chronic posterior urethritis and prostatitis exist they should

receive appropriate treatment; when the bladder is badly infected a preliminary cystotomy is advised. A plea is made for the earlier detection and operative interference so as to anticipate the cause of the disease. "Prostatic hypertrophy is now curable by means of an operation which though serious, is not hazardous when undertaken in proper time and manner. Anatomically, and now surgically, the simple perineal is the direct and preferable route." Dr. Syms is reported as having operated upon twenty-four cases with only one death.

The Treatment of Congenital Phimosis.

J. F. WOODYATT, M.R.C.S., Eng. "The Treatment of Congenital Phimosis." *Lancet*, August 29th, 1903.

According to the writer congenital phimosis is caused by a constricting ring of mucous membrane just inside the prepuce, and the prepuce itself is never redundant and never causes phimosis. Accordingly the usual circumcision operation is condemned. The method advocated is to retract the prepuce as far as possible, then snip through the constricting ring of mucous membrane on both sides, and then convert the longitudinal incisions into transverse wounds by suturing after the manner employed in pyloroplasty.

The Operative Treatment of Tuberculous Glands of the Neck.

J. G. SHELDON, M.D. "The Operative Treatment of Tuberculous Glands of the Neck." *New York Medical Journal and Philadelphia Medical Journal*, September 5th, 1903.

The complete removal of not only the glands but the fat, infected fascia and every structure except the important vessels and nerves is the radical measure advocated. The presence of a few tuberculous glands in any of the triangles warrants complete dissection of the entire triangle. The article is based upon what appears to be an insufficient number of cases, and is chiefly taken up with a résumé of the surgical anatomy of the triangles.

The Cure of the more Difficult as well as the Simpler Inguinal Ruptures.

W. S. HALSTED, M.D. "The Cure of the More Difficult as well as the Simpler Inguinal Ruptures." *Bulletin of the Johns Hopkins Hospital*, August, 1903.

In this contribution Dr. Halsted gives a brief review of the evolution and perfecting of his operation. The steps of the operation are given and admirably illustrated by six drawings. The veins are excised, the vas deferens disturbed as little as possible, the sac tied off high up and fixed after Kocher's method. The cremaster is sutured to the internal

oblique to reinforce the lower end of the wound and when the internal oblique and conjoined tendon are atrophied the sheath of the rectus is employed for the same purpose by suturing it along with the tendons to Poupart's ligament. The results obtained have been most favorable.

Tumour of the Intercarotid Body.

CHARLES L. SCUDDER, M.D. "Tumour of the Intercarotid Body." *The American Journal of the Medical Sciences*, September, 1903.

Only six cases have been reported, four by Paltauf and one by Marchand. The tumour in this case involved the common, internal, and external carotids, necessitating their ligation in its removal. The pathological diagnosis was "a variety of angiosarcoma, known as perithelioma." The patient made a good recovery.

Further Observations on the Influence of the Roentgen Rays upon Sarcoma.

WILLIAM COLEY, M.D. "Further Observations on the Influences of the Roentgen Rays upon Sarcoma." *New York Medical and Philadelphia Medical Journal*, August 8th, 1903.

The results obtained in 36 cases of inoperable sarcoma are tabulated. The treatment was not confined to the X-ray, but in some cases the toxine treatment was combined with it. On comparing the relative merits of the two, toxine gives the better results. Some cases of round-celled sarcoma not benefited by the toxines showed marked improvement under the X-ray, but recurrence took place in all of them after treatment was discontinued. On the other hand a much larger number of round-celled sarcoma gave better results under the toxine, twenty being free from any recurrence after 3-10 years, and fifteen after 5-10 years. In spindle-celled sarcoma X-rays give very little result, while 50% of such cases have disappeared under toxine treatment. He believes "the combined treatment will give better results than either used alone." The X-rays should be used only in inoperable cases, exception being when an extremity is involved and amputation required. Here the combined treatment should be tried. "Thus far we have proved that the X-rays have a very decided inhibitory action upon the various forms of sarcoma, in some cases, sufficient to cause entire disappearance of inoperable tumours. Yet there is a strong tendency to local or general recurrence, and in no instance has sufficient time elapsed to warrant us in considering the patient cured. Good results cannot reasonably be looked for without prolonged treatment extending over many months and in some cases years."

MEDICINE.

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

Differential Leucocyte Count in Early Days of Typhoid Fever.

HENRY A. HIGLEY. "Differential leucocyte count in the early days of typhoid fever." *Medical Record*, September 19th, 1903.

This is a paper read before the New York Pathological Society. The author quotes the conclusions of Türk, Naegeli, Ouskow, Thayer, and Winter. From their observations he considers it definitely settled that in uncomplicated cases of typhoid, the polymorphonuclear neutrophilic leucocytes are relatively and absolutely decreased, while the large mononuclears are always relatively and usually also absolutely increased in number and that furthermore the small mononuclears are relatively and absolutely decreased, normal or increased, the eosinophiles being both relatively and absolutely sub-normal. Without any desire to minimize Thayer's results or bring them under suspicion, he points out that Thayer has not stated the grounds upon which the diagnosis of typhoid fever was made, nor the facts which led him to suppose that the counts were, in truth, made during the first week of the disease, and adds that the counts were not made individually by him, but by different internes at the Johns Hopkins hospital.

Two years ago Dr. Higley began a series of observations upon the subject and has come to the following conclusion based upon sixteen cases: "That in many instances the differential leucocyte count which may be called characteristic of typhoid fever is present, contrary to general supposition, during the first week of the disease," and "that the definite value of the differential leucocyte count in the early diagnosis of typhoid fever is as yet problematical; but it seems certain that when used in addition to the total leucocyte count, more information may be obtained than by employing the total count alone."

The Inoculability of Human Tuberculosis upon Bovines.

D. J. HAMILTON. "The inoculability of human tuberculosis upon bovines." *British Medical Journal*, September 12th, 1903.

Professor Hamilton, in his opening address, before the 71st annual meeting of the British Medical Association, dealt largely in a controversial manner with the problem of inoculability. He defended the experiments conducted by himself and Mr. Young, and affirmed again that they went to confirm the unity of the bovine and the human organism. In conclusion, he says: "I cannot but think that the question of the transmissibility of human tuberculosis to the bovine is pretty well settled in the affirmative. The opposite side of the question, whether

bovine tuberculosis is transmissible to man, can, of course, never be proven experimentally, and must for ever remain a matter of conjecture."

The Leucocytes in the Summer Diarrhœa of Children.

JOHN ZAHORSKY. "The Leucocytes in the Summer Diarrhœa of Infants." *N. Y. Med. Jour. and Phila. Med. Journal*. 12th September, 1903.

According to the studies of Japha (*Jahrb. f. Kinderh.*, 1901), and Knox and Warfield (*Johns Hopkins Hosp. Bull.*, July, 1902), the healthy infant has about 13,000 leucocytes in the cubic millimetre. The differential count in the normal infant is approximately as follows:— polymorphonuclears; 40 per cent, lymphocytes; 55 per cent, large mononuclears; 5 per cent.

Dr. Zahorsky concludes that the normal ratio of the polymorphonuclears to the lymphocytes in healthy infants is 2 to 3 or 4. In gastro-enteric disease this ratio becomes changed; the leucocytes gradually increase and the lymphocytes diminish, when the ratio becomes 1 to 1, 4 to 3, 3 to 2, 2 to 1, and 3 to 1 successively. This predominance of the polymorphonuclears, therefore, becomes a corroborative sign of the intensity of the morbid process. A great relative increase in the polymorphonuclears means that the child is very ill, whatever other signs may indicate.

Upon the Virulence of the Bacillus of Bovine and Human Tuberculosis for Monkeys.

ALLAN MACFADYEN. "Upon the Virulence of the Bacillus of Bovine and Human Tuberculosis for Monkeys." *Lancet*, September 12th, 1903.

The experiments forming the subject of this note were undertaken with the view of ascertaining in how far the human and bovine strains of the tubercle bacillus agree or differ as regards their infective properties for the monkey. The methods adopted were mainly feeding experiments, as the particular object of the investigation was to determine to what extent the digestive tract is capable of acting as a channel of systemic invasion for tubercle organisms derived either from cattle or from man.

In the experiments the monkey proved susceptible to an inoculation with the bacillus of bovine tuberculosis either directly or after one passage through the organism of the guinea-pig. A certain number of the animals died in two or ten days after feeding with bovine and human tuberculous material. Normal human sputum did not produce this effect and the result suggested some form of intoxication. The

monkey fed thrice, twice, or once with the bovine material succumbed to a general tuberculosis in about from one to two months, and fed with the human material the same results and fatal effects were produced in about the same period of time. The young monkey proved to be equally susceptible to the bovine and human strains of the tubercle bacilli. The striking difference in the effects produced occurred in the digestive tract. Intestinal lesions were found in the case of every monkey that had been fed with human tuberculous material, whilst none of the monkeys fed with the bovine material presented any evidence of tuberculous ulcers in the intestine. Within the limits of these experiments it would appear that virulent bovine tubercle bacilli may pass through the intestinal wall in large numbers without any detectable lesion of the gut being produced. It would also appear that a food tuberculosis can be as readily brought about by the bovine as by the human strain of the tubercle bacillus in the young monkey.

The Treatment of Cancer and Other Forms of Malignant Disease by Electric Osmose.

CLARENCE A. J. WRIGHT. "The Treatment of Cancer and Other Forms of Malignant Disease by Electric Osmose." *Lancet*, 12th September, 1903.

After giving details of cases, upon which this method of treatment was employed, Mr. Wright concludes: "I would venture to suggest that 22 per cent. of successes is still sufficiently encouraging to recommend this method of treatment to the attention of the profession for a more extended trial than I have yet given it. It is not put forward as a cure for cancer, but as a suggestion of the line of treatment to be adopted till that is really discovered. I personally believe that a "radio-active salt of strontium, introduced into the tissues by cataphoresis by high frequency," will prove the desired panacea of all forms of malignant disease."

Solitary Tubercle of the Stomach.

ROY McL. VAN WORT. "Solitary Tubercle of the Stomach." *Bulletin of Johns Hopkins Hospital*, September, 1903.

Dr. Van Wort reports a case of "a hitherto undescribed form of tuberculosis of the stomach." Tuberculosis of this organ is not unknown. Saltam Fenwick in 2,000 autopsies at the London Hospital upon patients dead of tuberculosis, observed the condition in two cases. Marfan was able to collect only about a dozen authentic cases. Perforation of the stomach occurred in three cases by ulceration of a tuberculous gland and Alice. Hamilton described three cases from the Johns Hopkins Hospital wards. Osler, however, states that the primary disease is unknown.

Dr. Van Wort's conclusions are : (1) The case is one of solitary tubercle in the muscularis of the stomach in which tubercle bacilli were found in the tissues and recovered from an experimental animal with the production of the typical lesions of tuberculosis. (2) It is impossible to state whether the lesion was primary in the stomach, but there is no definite evidence to the contrary.

DERMATOLOGY.

UNDER THE CHARGE OF F. J. SHEPHERD AND G. GORDON CAMPBELL.

Roentgen Rays in Dermatology.

STELWAGON. "Some Observations on the use of Roentgen Rays in Dermatology." *The Journal of Cutaneous Diseases including Syphilis*, Aug., 1903.

PUSEY. "The Rationale of and the Indications for the Therapeutic Use of Roentgen Rays. *Ibid.*"

Almost immediately after the discovery of Roentgen rays dermatologists saw in it a possible new agent in the treatment of certain classes of skin disease, and since then every year has added more and more evidence of its value. Not only so but, if we can believe the reports, an ever increasing number of diseases is found in which X-rays have proved useful, and so enthusiastic have many of the workers in this field become that one would judge that the universal panacea for all skin diseases had at last been discovered. Recognizing that Roentgen rays as a therapeutic agent in dermatology were in danger of falling into more or less disrepute from the extravagant claims of the extremists, just as sulphur, arsenic, and thyroid extract have done in the past, Stelwagon, of Philadelphia, and Pusey, of Chicago, undertook in two excellent papers delivered before the last meeting of the American Dermatological Association to sum up the evidence so far adduced regarding the scope of this agent in the treatment of the dermatoses.

As yet no means of properly measuring the dosage of this form of energy has been devised and much difference of opinion exists regarding the kind of tube, length of exposure and distance from the target that are most serviceable. Judging from the opinions of the authors, however, and of those who took part in the discussion following the reading of their papers, it would appear that care must be taken to avoid the production of the cauterizing effects of the rays at the beginning of treatment, while great pains should be taken to protect the healthy tissues of the patient and the exposed parts of the operator.

Stelwagon and others, report severe burns of the hands, eyes and

thinning of the hair of the scalp from exposure to the rays while administering treatment.

As a curative agent Stelwagon considers that the X-rays have proved of most value in Epithelioma and more particularly in cases of rodent ulcer, especially those which are situated in the neighbourhood of the eyes and nose. He believes that most cases of this disease can be favourably influenced without the production of any dermatitis from the caustic action of the rays. He begins treatment with an exposure of five minutes, twice weekly for two weeks, with the tube at a distance of twelve inches. In the event of this failing to produce a positive effect the distance of the tube is shortened and the time of exposure lengthened until a slight erythema is induced; and in some cases ten minute exposures at a distance of five inches three times a week were found necessary. He admits that in some instances the unintentional production of a moderate degree of dermatitis was followed after the cessation of treatment by most favourable results. In order to as far as possible shorten the duration of the treatment, he advocates enucleation of the ulcer by curette or other means before beginning the application of the X-rays.

In lupus vulgaris, Stelwagon has not had as good results as in the treatment of epithelioma and makes the criticism that many of the recorded cures of this disease were in reality, as shown by the reports, rodent ulcer. He recognizes, however, the value of the rays as a means of treatment and considers that the Finsen light method has in it a formidable competitor.

Acne. The cases most likely to be benefitted are those of a sluggish, indurated type. The use of this agent in ordinary cases of this disease is not to be recommended.

Psoriasis. Here, in old chronic patches resisting other forms of treatment, the use of Röntgen rays has been followed by some remarkable results.

Of eczema, again the same may be said, the cases in which this agent is likely to be found of most value being those in which a stimulating treatment is evidently indicated, those of the chronic much indurated, relapsing type, but little influenced by the ordinary remedies.

In Keratosis of the palms and soles many instances of rapid and apparently permanent improvement have been reported.

In one case of local Hyperidrosis, it was accidentally discovered that the rays had a curative effect.

In summing up, Stelwagon believes that we have in the Röntgen rays a therapeutic agent of great value, but not one that possesses the marvellous powers accredited to it by many writers in large numbers of the dermatoses.

Pusey in his article summarized the changes that occur in the skin when exposed to the action of the Röntgen rays. These are briefly those produced by an irritant of unusual character, which, when sufficiently intense, leads to the destruction or atrophy of the part. He quotes Ondin, Barthelemy and Darier's statement that "this irritation seems to increase the vitality of the least differentiated elements, while it produces degeneration and atrophy of the more highly differentiated structures—nails, hairs and glands." The effect produced upon a diseased tissue such as carcinoma is "degeneration and absorption of diseased cells and their replacement by healthy connective tissue, without the destruction of the healthy stroma." There is no effect upon bacteria in a culture medium, and the undoubted destruction of bacteria in living tissues is an effect to be explained by increased phagocytosis under the increased condition of activity excited by X-rays.

The actions of X-rays which can be made use of therapeutically are:—

- (1) Causing atrophy of the appendages of the skin.
- (2) Destructive action upon organisms in living tissues.
- (3) The effect upon the metabolism of tissues.
- (4) The power of destroying certain pathologic tissues.
- (5) The anodyne action.

In applying these effects to the treatment of skin diseases, Pusey gives the possibilities of usefulness in those affections in which the following indications exist:—To remove hair, to cause exfoliation of the nails, to cause atrophy or decrease in functional activity of the sebaceous glands, to destroy bacteria, to influence the nutrition of the skin, to destroy tissues of low resistance, and to relieve pain and itching. Pusey does not recommend the use of radiotherapy in the removal of hair, while he found it successful in 75 per cent. of cases, the difficulties and dangers of the work rendered it impracticable. In sycosis and tinea sycosis, good results were obtained, and in acne the results in many cases could be described as marvellous. In lupus and epithelioma, the greatest success was obtained. In eczema, Pusey's opinion corroborated that of Stelwagon, that in the chronic indurated cases it was most valuable. Psoriasis also cleared up readily after a few applications, but it had no effect upon the recurrence. The anodyne effect has been made use of in anal and vulgar pruritus, and its analgesic effect upon the pain of malignant disease of the skin is well known.

In the discussion which followed the reading of these two papers, many of the members agreed with Dr. Stelwagon as to the value of radiotherapy in the diseases mentioned by him and without exception all agreed that its use was to be recommended only in such cases as were not amenable to ordinary methods of treatment.