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The KINGSTON MEDICAL QUARTERLY is presented to the Medical Profession with the compliments of the Editorial Staff. Contributions will be gladly received from members of the Profession and willingly published. JOHN HERALD, Editor.

All Communications for publication must be addressed to DR. HERALD, No. 199 King St. East.

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THE ELECTIONS FOR THE ONTARIO MEDICAL COUNCIL.

HITHERTO the QUARTERLY has taken no part in the elections for the Ontario Medical Council, but the present election seems to us to be out of the ordinary and to justify us in laying our views before our readers for their consideration. At the last session of the Provincial Legislature there was introduced a Bill to amend the Medical Act, which, had it become

law, would have made some most radical changes in the composition of the Ontario Medical Council. The Bill did not pass the Legislature, and there seemed to be a general feeling that it would be unwise to interfere with the composition of the Council just on the eve of a general election. It was further agreed that all qualified practitioners in Ontario, whether they had paid their fees to the Council or not, should be allowed to vote at the next election. Accordingly at the next election which takes place in November every practitioner in Ontario will be allowed to cast his vote. In this way it is hoped that a full expression of the views of the profession will be obtained as to the composition of the Council. Upon the result of this election will largely depend the character of future legislation. If there should be an overwhelming majority of the members elected in favour of maintaining the Council as at present constituted the Legislature will not interfere. If, on the other hand, even a respectable minority of the members elected are in favour of altering the composition of the Council along the lines of the Bill introduced last session, an attempt will be made to have the Medical Act so amended. In the interests of the profession and in the interests of the public it is manifestly the duty of every practitioner to record his vote on this occasion, and not only to record his vote but to fully realize the issue and to see that the candidate for whom he votes will, if elected, be a representative of the views which after careful study of the whole question he believes to be fair and just to all. For some years, as every practitioner knows, there has been going on an agitation to deprive certain institutions of the representation which they have had since the foundation of the Council and at the same time to reduce the representation of the homoeopathic practitioners in the Council. It is true that the agitation has not gained much strength judged by the number of the members of the Council in favour of the proposed changes in the composition of that body. However, it behoves those who are opposed to these changes to be on the alert lest a march be stolen upon them. Such a victory at the ensuing election would mean much. Under the existing circumstances

we feel that we will not be trespassing beyond the limits of propriety by placing our views upon the matter at issue before our readers and by asking them to first carefully consider the whole question and then to cast their ballots as they deem best in the interests of the profession and the public.

Previous to the formation of the Council a license to practice medicine could be obtained from the Governor in Couucil on presenting a diploma from certain institutions and on payment of the nominal fee then required. In the interest of the public these institutions on certain conditions agreed that their diplomas should no longer entitle the holders thereof to a license. One of these conditions was that these institutions should be represented in the Council. This right has up to the present been cheerfully accorded these institutions. Some members of the profession would now take from these institutions this right guaranteed them at the time of the formation of the Council and without which the Council would never have come into existence. Such an act would be a breach of faith, and we do not believe that the profession will be a party to the renunciation of a solemn pledge given to these institutions at the time they in exchange for representative on the council agreed to give up privileges previously enjoyed by them. We have sufficient faith in our fellow practitioners to believe that they wlll vote for candidates pledged to maintain the bargain made years ago and to preserve the honor of our profession. So long as these institutions and the homoeopathic practitioners demand that the rights guaranteed them at the formation of the Council be maintained so long must we in honour accord them these rights.

IMMUNITY.

Presidential Address delivered October 6th, 1902, before the Kingston Medical and Surgical Society.

GENTLEMEN :—

PERMIT me first to thank you most heartily for electing me to the honorable position of President of this Society. Believe me, I look upon it as a very great honor and as a token that my work in Kingston for the past seven years has not been altogether a failure. It has been the custom since our society was organized a little over six years ago for the incoming President to open the winter's proceedings by an address or paper on some subject of medical interest and in falling in line with this custom I have chosen the important subject of immunity upon which to address you this evening.

This subject is one of the most fruitful topics of investigation and discussion amongst workers in the fields of bacteriology and experimental pathology, is also one of vast importance to the sanitarian and is daily assuming more importance to the practicing physician.

One may define immunity as the possession of the power of resistance against disease, either general or specific. As its opposite we have predisposition or susceptibility, yet we cannot lay down in many instances the line of cleavage between the two conditions for one fades indefinitely into the other.

All living beings have certain natural powers of resistance against disease (injurious agencies) generally. In some, these powers of resistance are highly developed i.e. such individuals possess a high natural immunity. On the other hand we find individuals or species in whom the resisting powers are low, they are susceptible to all forms of injurious agencies, predisposed to disease. This natural resisting power of the individual varies greatly at different periods and is subject markedly to the influences of external conditions. We all recognize the injurious influences upon tissue resistance of poor food, bad ventilation, cold, improper clothing, uncleanly surroundings, drug habits

and the like, and such agencies require no further discussion. This part of the subject of immunity is, however, one of the greatest interest to practicing physicians, as the predisposing factors are often more important than the infectious agents themselves in bringing about disease, and the removal of such factors is of the greatest moment in both preventive and curative treatment.

Apart entirely from the natural resisting powers of the body we have a different form of immunity, viz :—An acquired or specific form against certain infections. Thus we find that attacks of such diseases as small-pox, measles, scarlet fever give an immunity against further infection from these diseases.

It is with this subject of acquired immunity I propose mainly to deal. In the first place note that this form of immunity is specific, i.e., is active against only that infection against which the immunity has been acquired. This form of immunity cannot as yet be developed against many infections; if it were possible then medicine would be confined, so far as the infectious diseases are concerned to the science of prevention.

In what ways do we find that we can acquire this form of immunity. In the first place it is a fact known for decades that recovery from many diseases is accompanied by the acquirement of an immunity against these diseases. With some infections this immunity is life long, with others the immunity lasts months or years while others show practically no immunity, e.g., after pneumonia, immunity is at most a matter of a few days or weeks. Again, tubercular infection may attack the lung, may be healed and days after fresh infectious material be introduced and find a suitable nidus. One can see that this method has many and serious limitations and physicians never think of sanctioning such a method of acquiring an immunity. A few mothers, however, still purposely expose their children to such diseases as scarlet fever and measles, so as to get through the full course of children's diseases. This method was also made use of in the old custom of inoculation against the smallpox.

Another way in which immunity can be developed against some infections is by vaccination. I use this term in its wide

sense not in its restricted use of vaccination against smallpox. A vaccine is simply a modified or attenuated form of the virus so that when such a material is used we have a corresponding modification of the disease process which, however, affords protection. I will endeavor later on to explain how I believe such attenuated virus has generally as powerful an effect as recovery from the disease process itself. The diseases against which vaccines are used are smallpox and rabies in man, anthrax in cattle and sheep, blackleg in cattle and rouget in swine.

A third way in which we find immunity can be developed in certain instances is by the use of the toxins or metabolic products of certain bacteria. In some bacterial species the toxins are thrown off from the cell as soluble prducts while in others the true toxins are bound up with the cell plasm and hence the dead bacterial cells have to be used in such cases. We have an excellent illustration of the immunizing power of intercellular toxins in the prophylactic fluids now so extensively employed against the plague and the cholera. (In the method of immunization against cholera, while living cholera vibrios may be employed in the second injection, yet as the vibrios are not in their normal habitat in the tissues and do not multiply therein, but rapidly die, their products only are active.) The early inoculations in the preventive treatment of rabies are also undoubted examples of this form of immunization. The method of toxin (soluble) immunization is also extensively employed on animals used in the production of the various antitoxic serums, e.g., those of diphtheria, tetanus and streptococcus infections. An attempt has been made with many other infective bacteria to obtain practical results by this method. Prominent among these is the use of the various tuberculins from the original preparation of Koch to the numerous forms now on the market. The curative results with these (except in certain animals) are to say the least very discouraging.

The types of acquired immunity so far considered are those commonly termed the active forms, because the tissues have had to actively contend against and overcome the disease agents

themselves or their products, and develop the immunizing substances. Of different character is the immunity acquired by the addition to the body tissues or fluids, of substances in themselves immunizing. In this way is developed so called passive immunity. The agents which we find producing this form of immunity are certain drugs and antitoxic serums. Such substances are not only protective but curative as well. Practically the only drug extensively used as an immunizing agent is quinine against malaria. In reality it is not immunizing but antimicrobic as it acts by destroying the young plasmodiæ and thus prevents their development in the blood or viscera.

Of much greater importance are the antitoxic serums of which diphtheria serum is now so extensively employed. Besides we have antitetanic, antistreptococcus and antiplague serums all possessing merit. Practically these serums are used as curative agents, but considerable use is being made of some of them for protective purposes, e.g., those against diphtheria and the plague. The protection afforded by the use of antitoxins is generally fleeting, contrasting fairly sharply with the protection given by the active methods of immunization. For example antiplague serum loses its protective properties in about 14 days, while the plague prophylactic (Haffkin) maintains an efficient immunity for six months or more.

I have outlined at greater length than I had intended the ways in which immunity can be conferred against various infections. Now comes the important question, how do these measures produce immunity? As for antitoxin immunization we must first have an immune animal from which to obtain the serum, I can leave antitoxin out of consideration for the present.

It is a well known fact that bacteria act as infecting agents through their toxic products. The relation of these metabolic products to the bacterial cell body is the important factor in the distribution of the bacteria in relation to the lesions found in the various diseases, and is also a very important factor in determining the character of the immunizing substances. Thus, with those bacteria which form soluble and diffusible toxins the immunizing bodies are mainly antitoxic in character, while

with those where the bacterial cells hold the toxin the immunizing bodies have a destructive effect on the bacteria themselves. This will necessitate a consideration of both the soluble toxins and their antibodies and the intercellular toxins and their antimicrobic substances, in their bearings on immunity.

Bacterial toxins differ from ordinary chemical poisons in some important particulars. Thus toxins enter into direct combination with the cells (special groups) and are not present in solution in protoplasm, nor do they destroy, as a rule by direct destructive effects on cell plasm. Again, toxins are capable in many instances, of producing antitoxic bodies thus differing from ordinary chemicals. Further, as toxins unite directly with the cell plasm the incubation period is usually delayed, thus tetanus toxin may take 24 to 36 hours to show evidence of it specific properties. (This delay in onset is found with some chemicals, e.g., in the specific action of phosphorus on the liver.) The toxins of the various bacteria have a selective affinity for certain groups of cells just as various chemicals exert their poisonous action on certain organs. Thus the toxins of tetanus and also of diphtheria when mixed with emulsions of the brain and cord, lose their toxic properties by uniting with the nerve cells, i.e., they form compounds, harmless to other animals when inoculated into them.

At this point one must step into the realms of theory for an explanation of the facts known regarding immunity, and must direct attention to the really fascinating conception of Ehrlich in explaining many of its problems. Ehrlich conceives each cell of the body to possess, besides its nucleus, large numbers of attached atom groups, which he terms lateral chain groups or receptors. These receptors possess a selective affinity for certain food materials, and it is through them that the special foods for the nutrition of the cell as a whole are withdrawn from the blood and lymph. Certain of these receptors find different toxins assimilable and seize upon them.

Now the toxin, Ehrlich conceives to consist of at least two parts, an atom group which unites or anchors it to certain receptors of the cell; and secondly, the toxic atom group which can on-

ly when anchored exert its poisonous effects on the cell. (These groups have received the names of the haptophore and toxophore groups respectively.) The union between the cell receptors and anchoring group of the toxin throws out of function that portion of the cell receptors so united. If many of the receptors are united to the haptophore or anchoring groups of the toxin the cell is overwhelmed, but if not then the remaining unsaturated atom groups multiply to replace the saturated group. This regeneration of the receptors, following the law of tissue regeneration generally is apt to be excessive, (Weigerts!) and the overplus of 'receptors' will be thrown off into blood constituting toxin fixing substances or antitoxin. Naturally, where we have repeated stimulation of the cells by subtoxic doses of the toxin we will greatly increase (other things being equal) the formation of the antitoxic substances. Thus, it is found that in the preparation of diphtheria antitoxin as the doses of the toxin are gradually repeated and increased, so the antitoxin formed increases up to a certain maximum. It is to the presence of these antitoxic 'receptors' in the blood that we can ascribe immunity in many diseases.

How is it that an attenuated virus, a vaccine produces immunity? It is a well known fact to bacteriologists that toxins on long standing or by the action of chemical substances may lose their toxicity and become what are termed toxoids, yet injections of such toxoids will engender an immunity against the true toxin. The toxoid is believed to possess only the anchoring or haptophore group of the toxin and has lost or changed the constitution of its toxophore group. The unanchored cell receptors are stimulated in the same way as by the toxin and an immunity is created. Now I believe that the attenuated virus produces toxoid substances or at least a minimum amount of toxin so that it has the same effect as the absorption of toxin itself. In other words attenuation of virulence of a bacterium, or mildness of a epidemic are to be ascribed to the formation of 'toxoid,' instead of the true toxins (whether soluble or intercellular).

Antitoxin, as is evident from this description, acts only against the toxin and practically is only of marked value where the toxin is a soluble and diffusible one, as in diphtheria and tetanus. It does not act against the bacteria themselves, and its production and value in those diseases due to bacteria whose toxins are mainly cellular, is usually low. After infections of this latter class there are found in the blood certain bodies which possess a peculiar disintegrating power (antimicrobic or bacteriolytic) on the bacteria causing the disease. At times, in such infections, bodies are found which have an agglutinating and precipitating effect when added to cultures of the bacterium. Frequently these two kinds of bodies (bacteriolytic and agglutinating) are found together in the blood, but either one may be present without the other, so that while the two processes are to a certain extent related, it is likely that they are essentially independent. Like antitoxin these bodies are specific and will need to be studied more in detail.

If a rabbit is immunized against injections of the cholera spirillum it is found that its serum when fresh drawn has the property of first agglutinating and then disintegrating the cholera spirillum when added in fresh culture. If this serum is allowed to stand some days or is heated to a temperature of 130° F. for twenty minutes it loses its bacteriolytic power while still retaining its agglutinating action. If to such serum, some serum from a non-immune rabbit is added its bacteriolytic properties are restored. From these facts one learns: 1st, that the agglutinating and bacteriolytic bodies are different substances. 2nd, that bacteriolysis depends on two substances, first, some specific body developed in the immunizing process, and second, a substance which is normally present in the serum and which is destroyed by heat or on long standing. Without this substance which Ehrlich terms the 'complement' (or addiment) bacteriolysis cannot occur. Again one must bring to his aid Ehrlich's conception of the rationale of this process to explain satisfactorily these facts. Ehrlich looks upon the specific body or 'bacteriolysin' as having a double set of 'receptors' (amboceptor.) Through one set it is bound to the bacterial cell,

through the second to the 'complement' normally found in the serum. He looks upon this 'complement' as having a similar structure to the toxin, viz., an anchoring group, and replacing the toxophore group a 'fermentative' or 'zymogenic' group, which being bound to the bacterial cell through the interposition of the 'bacteriolysin' ferments and disintegrates it.

The formation of the specific antimicrobic or bacteriolytic bodies is explained in exactly the same manner as the formation of antitoxines, i.e., as products of cell activity. The bacterial cellular structure acts in like manner to the toxin, and produces a reactive change in certain cells with whose atom groups there has been a fusion. The immunity which is developed against such infections as cholera, plague and rabies is to be explained mainly by the development of antimicrobic substances in the blood. It has been found that the cells of the body react in a specific manner, not only against bacteria, but even against such substances as the blood of other animals, milk or cellular elements as epithelum or the parenchymatous cells of the various organs. Thus, if we inject a horse repeatedly with the blood of a sheep, the horse's serum when mixed with fresh sheep's blood produces a disintegration of the corpuscles or haemolysis. But the horse's serum will not have this effect on the blood of other animals. The principles just stated are found to apply to all animals tested and have been employed in the diagnosis of human blood. Thus, a solution is made of a suspected human blood stain, and to it is added the fresh serum from an animal (rabbit) immunized against human blood. If the blood is human the corpuscles are precipitated and disintegrated. Nuttal has recently shown that this reaction is constant, though he found the blood of certain monkeys would haemolize like human blood. This test will in all probability soon assume considerable medico-legal importance.

In a similar manner to the phenomena of bacteriolysis and haemolysis it has been found that injections of emulsions of cells of various organs leads to the production of bodies in the blood which disintegrate and destroy these cells (cytolysis) more or less, both in the test tube and in the body. Is it pos-

sible to make any use of this fact? I have not seen any literature bearing on the subject, but it seems to me that we have here a possible specific means of treatment of sarcomas and carcinomas. For if by injections of cancer cells into animals we can produce in their serum bodies capable of destroying such cells, it is within the range of possibility that we have in such serum a remedy which would at least prevent further development of the growth. (No one recognizes better than myself the limitation and difficulties of this problem.)

Again, it has been shown that if animals are injected with cytolytic serum gradually their blood develops anticytolytic properties. Will it be possible to use a specific anticytolytic serum to bring about recovery in injured or diseased cells of various organs? Of course the bearing of this on therapy is yet in its theoretical stage—some day it may be practical—but from the few facts outlined one can see its possibilities. However, I will not now pursue this subject further.

Finally, I have yet one set of bodies to deal with before concluding, viz., the agglutinating bodies or precipitins. While bacteriolysis and haemolysis are often accompanied by agglutination, yet we will often find this condition produced by serum without there being any destructive or disintegrating power in the serum. This phenomenon usually develops early in the course of an infection and thus before antitoxic or bactericidal properties are manifest in the blood. In bacterial infection it disappears very shortly after the disappearance of the infective agent, and hence is believed to be a phenomen due to the presence of the bacterial cell bodies. Many claim it is simply a chemical process, as bacteria certainly can be agglutinated by the use of some very weak chemical solutions. Others claim, and with them I agree, that it is due to some special body developed in the body by the tissue reaction to the infecting agents and which would be explained on Ehrlich's theory as consisting of a haptophore group which anchors it to the bacterium, and of a 'coagulative group' which causes the 'stickiness' of the cell membrane and adhesion and precipitation of the bacteria. Whatever may be the proper explanation the

importance of this phenomen both practically and experimentally is very great. Thus, in clinical work it does good service in the diagnosis of typhoid fever, constituting as it does the basis of the 'Widal reaction.' Bacteriologists make use of this phenomen in the diagnosis of bacterial species and differentration of closely related varieties.

I have endeavored to sum up as shortly as possible some of the most prominent points connected with immunity. As can be seen there is much left unsaid and much yet to learn, and many are trying to solve its problems and are day by day adding to our knowledge of this fascinating subject, but I feel certain that many years will yet elapse before even its most important features have received complete solution.

SOME RECENT LITERATURE.

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W. T. CONNELL.

PASSAGE OF LARGE GALL STONE PER RECTUM.

CHOLELITHIASIS can usually be diagnosticated by the manifest and characteristic symptoms, viz., dyspepsia, uneasiness in region of gall-bladder, actual attacks of biliary colic, jaundice, and sometimes septic symptoms, but the following case exemplifies how obscure are the symptoms sometimes produced by very large stones.

Mrs. H., æt. 55, weight 209 lbs., mother of several children, complexion, light, remarkably clear and fresh, previous health remarkably good.

July 17, 1901. Patient was taken with an acute attack of nausea and vomiting but no pain. As she resided in the country I sent calomel to be given in divided doses, also bismuth subnitrate and oxalate of cerium tablets.

July 18. Patient reported better.

July 19. Vomiting returned and I visited patient for first time. On examination I found some tenderness in epigastric and right hypochondriac region, but the abdominal walls were so thick that no tumor in region of gall-bladder could be detect-

ed—pulse and temp. normal. She was vomiting profusely large quantities of a greenish blue fluid, but had no pain whatever. I gave gastric sedatives, stopped all foods and ordered sips of hot water.

July 20. I found patient better aud for the next four days she was allowed milk and soda water, broths of various kinds. She continued to improve but the vomiting recurred about every 24 hours.

July 25, 11 p.m. I saw the patient in consultation with Dr. G. C. T. Ward. She had been seized several hours before by a severe pain in the epigastric region and was vomiting

large quantities of bile tinged matter. We gave ¼ morphine hypodermically which controlled the pain.

July 26. Vomiting still frequent and urine almost suppressed. The pain was much less severe and lower in the intestines. For the next week the treatment was as follows :—

Every morning stomach was emptied by using the tube, then thorough lavage followed by a cathartic when necessary. Nutrient enemal every 4 hours. Thorough irrigation of colon daily. Pain controlled by chloretone. Catheterization as often as necessary. For first three days no food by stomach, then peptonoids in small amount.

August 1. Improvement was gradual and on this date after a free evacuation of bowels she passed a large stone, the description of which is as follows :—

Weight, 14¾ drachms; color, dark grey with yellowish spots; size, diameter 2½ ins. by 1⅝ ins. It is rough at one end as if eroded by projecting into intestine, while there is a large facet at the other end.

On section the appearances are those of the common cholesterin calculus. The nucleus is situated toward one end and the crystals of cholesterin are deposited in irregular striae about it. The stone is very white, but the lines of striation are faintly tinged yellow or greenish gray. On analysis the calculus consists almost entirely of cholesterin. There is a minute amount of bile pigment and a trace of calcium carbonate.

It is very evident from the composition of this stone and its facetting that it was formed in the gall-bladder. It is almost certain that its course into bowel was by ulcerating directly into transverse colon which lies in such close relationship to the gall-bladder. It does not seem possible that a stone of such size would pass through the small bowel so that the probability of its ulceration into the duodenum may be dismissed.

MARGARET SYMINGTON, M.D.,
Napanee.

THE DETECTION AND ESTIMATION OF SUGAR IN THE URINE BY THE ELLIOTT METHOD.

(Read before the Chicago Medical Examiners' Association, May 8, 1902.)

THE essential qualities which should decide our adoption of a test for sugar in the urine are a suitable delicacy and a competent reliability of reaction.

The crudest chemical procedure will detect the presence of sugar when it exists in large amount.

A smaller quantity of sugar in the urine than two (2) grains to the ounce rarely awakens suspicion of its presence by giving rise to clinical symptoms; however, from this fact it does not follow that the lighter grades of glycosuria are without pathologic importance.

Normal urine contains no sugar demonstrable by the ordinary methods of testing; therefore any amount that can be detected by chemical means at our disposal is distinctly abnormal and points to disturbance of starch assimilation which may develop into a diabetic glycosuria.

The "copper tests," on account of their simplicity, sensitiveness and ease of application, are most popular with the profession; while other less convenient but more reliable methods are excluded.

The "copper tests" all depend for their reaction upon the power which grape sugar possesses of reducing cupric oxide to a lower form of oxidation with the formation of cuprous oxide, which appears as a yellowish red precipitate.

Every member of the profession in this country is familiar with either the Fehling or Haines tests.

The Haines test is a decided improvement on Fehling's, since in its application only eight (8) drops of urine are used; however, it leaves much to be desired in delicacy and stability.

The test to be described in this paper belongs to the class of tests which has been referred to above, viz., the "copper tests," and was introduced to the attention of the profession by Dr. Arthur R. Elliott, of Chicago, some eight years since.

Repeated laboratory experiments for the purpose of comparing with other copper tests and the daily use during the past two and one-half years of the Elliott test by the writer, have served to demonstrate to him its superiority over other methods in use.

The test solutions are prepared as follows :

REAGENT NO. 1.

Sulphate of copper (C. P.) ....27 grains.
Glycerine (C. P.) ..... 3 drams.
Distilled water..... ..... 2½ drams.
Liquor potassae ..... q. s. ad. 4 ounces.

(Dissolve the sulphate of copper in the glycerine and water ; gentle heat will facilitate solution. When cool add the liquor potassae, mix thoroughly and filter. Filtration should invariably be performed, as it secures greater stability.

REAGENT NO. 2.

A saturated solution of chemically pure tartaric acid in distilled water.

METHOD OF APPLICATION.

About one dram of the cupric oxide solution (Reagent No. 1) is poured into an ordinary test tube and brought to the boiling point over a spirit lamp. Then add three (3) drops of the tartaric acid solution (Reagent No. 2) and boil again—after the addition of the tartaric acid solution, no change in the copper solution is observed excepting a slight deepening of the blue color. No more than three (3) drops of tartaric acid solution should be added, as that amount has been found to be sufficient. (The addition of the tartaric acid solution endows the method with its peculiar delicacy, and by slightly reducing the alkalinity of the copper solution prevents the precipitation of the earthy phosphates ; consequently, the phosphatic cloud, which is apt to form with the other copper tests, does not appear.)

Add the suspected urine drop by drop, boiling and shaking the test tube between each addition until reaction occurs, or until eight (8) drops have been added. Should sugar be present, a yellowish or reddish precipitate of cuprous oxide is

thrown down, differing in density and richness of color, according to the amount of sugar present. Do not add more than eight (8) drops of urine, because this amount never fails to develop a distinct reaction if there is present one-half (½) grain of sugar to the ounce of urine or one (1) part in one thousand (1000.)

A smaller amount of sugar than one-half (½) grain to the ounce is of no interest to the clinician. After the addition of the urine, where no sugar is present, the solution will be found to be perfectly clear and no noticeable change has taken place.

With this, as with other copper solutions, it is not advisable to continue the boiling for more than one-half (½) minute after the addition of the urine.

One decidedly advantageous feature of the "Elliott test" is that with a slight change of procedure it can be used for the quantitative estimation of sugar.

For this purpose the same quantity of each reagent is used as when applied for the detection of sugar. Liquor ammonia is added in sufficient quantity to insure a clear end-reaction and enough distilled water to dilute the test so that the process of reduction may be observed with exactness.

Mode of application for quantitative estimation is as follows: Take one dram of the cupric oxide solution; add to this three (3) drops of tartaric acid solution, and one dram of liquor ammonia (U.S.P.) These are thoroughly mixed and placed in a small flask or beaker, and sufficient distilled water is then added to bring the total volume of the test up to one (1) ounce.

The flask or beaker containing the solution, prepared as directed, is placed over the flame of a spirit-lamp or Bunsen burner, and when it is smartly boiling, the urine is slowly added, drop by drop, from either a graduated minim burette or pipette. As the blue color of the solution becomes fainter, a longer interval is allowed to elapse between the addition of each drop of urine. The addition of the urine is continued until the blue color of the solution has completely disappeared. The addition of the liquor ammonia does not interfere with the reduction of the cupric oxide by the diabetic sugar, but serves

to hold in solution the cuprous oxide, which would otherwise appear as a yellowish or reddish precipitate. Therefore, when enough diabetic urine has been added to reduce all the cupric oxide solution to cuprous oxide, the test solution becomes perfectly colorless.

After the blue color has disappeared from the test solution, we should then note the number of minims of urine used to bring about the end-reaction.

It has been found that the amount of the test solutions, carefully measured and mixed as indicated, represents a fixed sugar value of one-tenth (1-10) grain of grape sugar, *i.e.*, it is reduced and decolorized by exactly one-tenth (1-10) grain of sugar. Consequently, the amount of urine used to bring about the end-reaction contains exactly one-tenth (1-10) grain of sugar; and knowing this, the number of grains of sugar to the ounce can readily be calculated.

Example: In a specimen of diabetic urine, should we find the test solution is decolorized by the addition of twelve (12) minims of urine, then, as above stated, these twelve (12) minims of urine contain one-tenth (1-10) grain of sugar. Divide 480 (the number of minims in an ounce) by twelve (12) and the quotient by ten (10), and we get the number of grains in an ounce, which, in this instance, would be

$$\left(\frac{480}{12} \times \frac{1}{10}\right) = 4 \text{ grs.}$$

In applying the test for quantitative estimation, in order to secure accurate results, it is well to observe the following precautions:

1. Urine containing pus and other anatomical or chemical precipitates should be filtered, before being added to the test solution, in order to secure a clear end-reaction.

2. Do not add the urine too quickly to the boiling test.

3. The urine must not be added too gradually to the test, because volatilization of the ammonia may proceed more rapidly than reduction, and in the end some of the cuprous oxide may escape solution and make the test turbid.

4. When the test is started, it should be completed without interruption of ebullition, else some spontaneous reoxidation

of reduced protoxide may result, and thus interfere with the accuracy of the estimation.

5. Urines having a specific gravity exceeding 1.028, which by qualitative test give evidence of containing a large amount of sugar, should first be diluted with an equal volume of distilled water and the result subsequently multiplied by two (2).

After completion of the test, and when the solution begins to cool, the blue color returns to the reagent. This is due to the re-formation of the blue protoxide by spontaneous oxidation. Heating again will cause a disappearance of the blue coloration.

Summary of the advantageous features of the Elliott test:

1. It is more staple than any of the other copper tests.

2. It is very sensitive, since it gives a plain and characteristic reaction with as small an amount of sugar as ½ grain to the ounce.

3. No matter how concentrated the urine, this test solution is not reduced by non-saccharine reducing bodies, such as uric acid, creatinin, etc. The presence of these bodies in a concentrated urine causes a reduction of Fehling's solution.

4. The addition of the tartaric acid solution, by slightly reducing the alkalinity of the copper solution, prevents the appearance of the phosphatic cloud, which so frequently appears when either Fehling's or Haines' solution is used.

5. No other previous treatment of the urine is necessary before submitting it to the test.

6. Presence of albumen may be disregarded.

7. The same test solutions are used for quantitative estimation as are employed for the detection of sugar, and thus a multiplicity of reagents is avoided.

WALTER A. JAQUITH.

CASES OF MALPRACTICE.

RECENTLY we have had several of these cases in Ontario. We recall the following: Town vs. Drs. D. and R. Archer which was dismissed by Justice Falconbridge, Lyburner vs. Drs. Clark and Hopkins which was dismissed by Justice Ferguson, Cross vs. Dr. Shaw, in which judgment was given in favour of the defendent by Justice Boyd and the somewhat celebrated and long drawn out case of Kempffer vs. Dr. Conerty. This last was a particularly aggravating one. The circumstances were as follows:—A lad, Thomas Kempffer, fell from a tree on Sept. 11th, 1896 and sustained a Colles fracture. Dr. Conerty reduced the fracture and put the arm up in splints. When the splints were removed there was found to be some sloughing of the ball of the thumb. The parents of the lad claimed that the sloughing was due to the pressure of the splints and that therefore Dr. Conerty was to blame. Dr. Conerty claimed that the sloughing was due to the original injury and to the neglect of the parents to carry out his instructions as to treatment. The case was first set down for trial in the spring of 1898. The trial was adjourned on account of the illness of a medical witness for plaintiff. Then followed an argument at Toronto as to costs. This was decided in favour of the defendant. In the fall of the same year the case came to trial and after three days the defendant obtained a non-suit and judgment for costs. An appeal was made from this decision to the Divisional Court and the plaintiff was granted a new trial, and the defendant was saddled with the costs. An appeal was then made from this decision to the Court of Appeal. A new trial was granted, but a strong recommendation was made that the judge at the trial should take the case without a jury, and it was ordered that all costs must stand until the final disposition of the case by the trial judge. In the spring of 1901, when the case came up for trial it was postponed owing to the illness of Dr. King, a witness for the plaintiff. Again in the fall of the same year it was postponed

on account of the illness of Dr. Conerty. Then followed an argument in Toronto to alter order for adjournment. This was not granted. Finally in May last the case went to trial again and the action was dismissed by Justice McMahon. In giving his judgment the judge went very fully into the evidence submitted and closed a very exhaustive and critical resume of the case in the following words :—"Now, having regard to the treatment Dr. Conerty prescribed, which as he told Mrs. Kempffer could only be carried out by the boy being brought to his surgery for treatment, one cannot say that the present condition of the thumb is owing to the want of skill on the doctor's part. Whatever neglect there was, was not his neglect, and from the evidence of Mrs. Kempffer herself it is quite apparent that the doctor was finding fault with her for not making the boy keep his appointment in going to the surgery for treatment. That is borne out also by the evidence of the house-keeper, Mrs. Hunter, who says that she was present on one occasion when Mrs. Kempffer brought the boy there, and that the doctor was much dissatisfied with the condition in which the boy's hand was, and told Mrs. Kempffer that no progress towards a cure could be expected owing to the neglect of the father and mother in seeing that the boy came regularly for treatment. The findings I have made exonerates the defendant from the charge of a want of skill or care. The reduction of the fracture was perfect, and the condition in which the thumb is now found arises from want of care and attention on the part of the parents of the boy, and of the boy himself in not submitting to and following out the defendant's instructions. The action will therefore be dismissed."

Thus, we see in these four cases the doctors were exonerated from blame and the actions against them dismissed. So far this must be satisfactory to them and to their professional brethren. But think of the worry, anxiety and expense occationed these gentlemen by these actions, which by the result of the trials were shown to be baseless. No practitioner can tell when a similar action may be brought against himself, and this too, notwithstanding all the skill, care and attention he may be-

stow upon his cases. Is there no way in which the profession can assist a confrere under such harsh and apparently unavoidable circumstances? Attempts have been made to form a Protective Association. What has become of it? We would suggest that those who have charge of the Association commission some practitioner in each centre to interview his confreres and lay the advantages of such an Association before them. In this way we are persuaded that most practitioners would readily be induced to become members.

THE DIAGNOSIS OF ACUTE SUPPURATION IN THE ACCESSORY SINUSES OF THE NOSE.

ACUTE inflammation of these cavities occurs more frequently with acute coryza, influenza and the exanthemata than is generally supposed to be the case. The onset is masked by the severity of the coryza, but the patient's attention is often drawn to the fact that the discharge is more than usually copious, especially from one nostril, and that it continues for a longer time than usual, and that it is offensive. The symptoms are modified by the closing of the ostium. If the ostium remains open the secretion drains away more or less freely; if it is closed the symptoms are aggravated by the consequent retention.

In acute inflammation and suppuration of the maxillary sinus, the coryza is aggravated by severe neuralgia in the cheek and forehead, accompanied by photophobia. There is some tenderness on pressure over the cheek or upon the gums. There may be a rigor with a rise of temperature. If there is a sudden and copious flow of secretion from the nostril, the severity of

the symptoms is diminished. The discharge may at first be serous or slightly blood-stained, becoming muco-purulent or purulent; from the first it may be thick creamy pus. Cessation of the secretion may be followed by a return of the symptoms, which are often again relieved by a sudden return of the discharge. This alternation is always suggestive of the condition. Orbital complications are rarely seen in acute suppuration of the antrum. When the nose is examined, the mucus membrane is likely to be found red and swollen, and the inferior turbinated turgescent. Pus may be found in the middle meatus, especially after the head has been inclined forward. Transillumination with the electric lamp in the mouth will establish opacity of the cheek on the affected side. It may be necessary to diagnose between suppuration of the antrum and an acute periostitis of the upper jaw. In the latter case, swelling over the facial surface and the absence of the intra-nasal signs will assist in deciding.

Acute inflammation of the frontal sinus begins with symptoms resembling those described in connection with the antrum. The general disturbance is accompanied by intense frontal headache and a feeling of weight or oppression over the eye. Percussion over the inner third of the supra-orbital margin elicits tenderness. There may be redness and swelling of the skin and oedema of the upper lid; but absence of these external signs may lead to a diagnosis of severe neuralgia. A sudden discharge of pus from the nose relieves the symptoms. If the ostium frontale is blocked more serious symptoms supervene. The thin bony floor of the sinus offers little resistance to pressure from within, and with increased secretion, expansion of this wall takes place, forming a fluctuating swelling at the upper and inner angle of the orbit. Exophthalmos, and a displacement of the eyeball downwards and outwards, with visual disturbances result Some observers report assistance from transillumination of the frontal sinus, finding the affected cavity opaque or darker than that of the opposite side. If, in connection with such an examination, the maxillary sinuses are clearly illuminated, the diagnosis is certain.

Acute suppuration of the ethmoidal cells is not often met with. A few cases are reported, and the writer has recently seen two in which the diagnosis was established. The patients had severe headache, with a nasal discharge, first of a watery nature and then becoming purulent. Examination of the nose showed the mucus membrane red and swollen, with some pus on the middle turbinated body. Irrigation and making a free exit for the pus was followed by rapid relief and a disappearance of the discharge.

In the sphenoidal sinus acute suppuration has not often been recognized clinically, but several cases are described by Schaffer. The symptoms are those of an intense nasal and nasopharyngeal inflammation with intense pain in the occipital region and on the vertex of the skull. Vertigo was also a prominent symptom. An objective examination in the acute stage will probably show a red and swollen membrane in the posterior part of the nose and muco-purulent or purulent secretion may also be visible.

J. C. CONNELL.

SEPTICEMIA AND THE CURETTE.

TO attempt to break up an old established custom in any line of life is at best, a thankless job, and one likely to call down harsh criticism upon the head of the daring iconoclast.

To attempt to uproot old prejudices existing in favor of a certain line of practice in surgery, and diametrically oppose such practice, is to invite from some, adverse criticism of the harshest kind. The only recompense for this is a logical refutation of, or concurrence in the argument advanced, on the part of other members of the profession.

This latter is what I hope for, and if I provoke a discussion, or start a line of thought in the minds of half of the readers of this article, I shall have achieved all I started out to do.

Curetting the uterus to remove fragments of after-birth or other debris has been taught in our Medical Schools from time immemorial, and it is firmly fixed in the receptive and retentive mind of every Medical Student that the first move following any such abnormal uterine condition, is to cleanse the uterus by means of the curette.

That the organ should be thoroughly and aseptically cleansed admits of no argumenr, but that the work should be done with the curetting, I deny most emphatically.

The majority of cases of death following the decomposition of foetus or placenta in utero, are caused by the use of the curette, and I hold that septicemia may be avoided if a more rational procedure be resorted to.

The condition of the uterus containing septic matter is one of great congestion ; the thickened walls being coated internally and over the os with a thick, brown, tenacious mucus.

The congestion is active, and therefore the more dangerous in the event of the admission of septic matter into the circulation.

If the curette is used, denuding the walls of their protective covering, an immediate vaccination takes place with a septic virus, septicemia following in an incredibly short space of time (chemical metamorphosis is marvelously rapid in the circulatory system) and death quickly ensues.

If without using the curette, we can remove the septic matter from the uterus without disturbing the mucus covering, and enable the uterus of itself to expel the coating, we shall have taken a long step forward in the treatment of this class of uterine cases,

The uterus, by reason of its congestion may be made to perform a self-cleansing act by exciting the exudation of the serum of the blood into its cavity, thereby washiug itself out, and expelling all septic matter instead of absorbing it.

This process of exosmosis is induced by a properly combined alkaline solution at a temperature above 100° and a strict avoidance of Bi-Chloride, Carbolic Acid, Formaldehyde, or any antiseptic of an acid reaction or astringent nature, which would coagulate the fibrine and albumen of the blood.

The method of procedure is as follows :—

FIRST, The gentle removal of whatever fragments are lying in the uterine cavity, by means of forceps, care being taken not to tear from the walls any adherent piece.

SECOND, The gentle flushing of the uterine cavity with the alkaline solution (110°), the reservoir containing the fluid being not more than two feet above the level of the hips.

If the flushing could be continuously administered for a few hours (say two or three), the conditions would be more speedily reduced to normal, but the discomfort of the position of the patient (on a Douche pan) prevents this, and a flushing once every two hours with one quart of solution is about the limit of treatment.

For flushing the uterus, I use a small dilating uterine douche, and as there is plenty of room for the escape of fluid and fragments; there is no danger of fallopian colic or salpingitis.

The first flushing is frequently followed by contractile pains and expulsion of any previously adherent pieces, together with much of the mucus.

A tablet of Ext. Cannabis Indica, gr. ¼
Ext. Ergotin, gr. ½

every hour till desired effect is produced will contract the uterus and alleviate pain.

The bowels should be moved freely, both by enema and catharsis.

During the interval between douches, the patient should be kept on her back with the hips sufficiently raised to permit the retention in the vagina of as much of the alkaline solution as it will hold.

The rapidity with which this treatment will reduce temperature, relieve pain, stop vomiting and remove offensive odor is marvelous to one who has not tried it. Sometimes two flushings are sufficient to cleanse the uterus thoroughly; vaginal douches being all that are needed subsequently to complete the work.

Uterine congestion is speedly relieved, and the uterine discharge changes from brown, thick bad smelling mucus, to a thin transparent one, accompanied or followed by more or less of a flow of blood.

A reduction in the frequency of the flushings is desirable as soon as a tendency to return to normal conditions begins to be observed, as it frequently will within twenty-four hours. Then simple vaginal Douches every three hours with an occasional uterine flushing if symptoms indicate it.

The action of exosmosis (and endosmosis, for there is every reason to believe in the absorption of some of the fluid) is what is desired to relieve the existing congestion, as in Bronchitis, Pheumonia, congestion of Kidney, congeston of any mucous membrane, etc., and is the most rational means of restoring to normal condition.

I do not wish to be understood as decrying the use of that most valuable instrument the curette, but only the abuse of it to wit: its employment under such conditions as make it practically a sharp weapon loaded with septic matter, dangerous beyond the poisoned arrow of the Malay, or the fang of Corba, and utterly opposed to our modern ideas of antisepsis.

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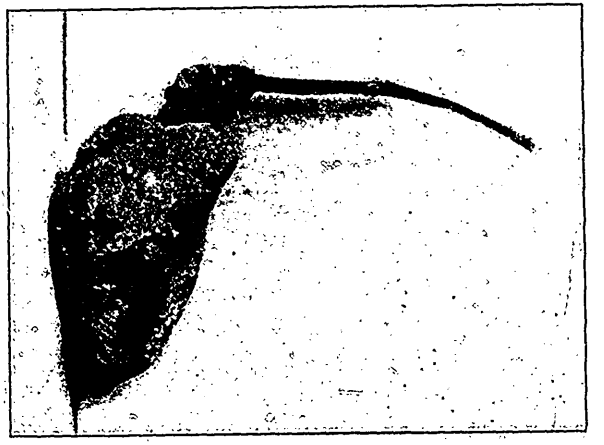
SURGICAL NOTES.

VESICAL CALCULUS.

IN June, 1901, I was consulted by a Mr. B. who stated that his son had passed blood with his urine. I advised him to bring the boy to my office and let me examine him, but heard nothing more about him until a couple of weeks later when I met the father who informed me that his son positively refused to have an examination made. The trouble, he stated, still continued, necessitating his rising at night three or four times at least to urinate. At last the young man was induced to let me see him, and on my suggesting the advisability of passing a sound into the bladder he refused, nor could any persuasion on the part of myself or his parents induce him to submit to an examination. His trouble continued during the following winter and last spring, until one night I was summoned in haste to him. I found him suffering great agony from a retention of urine that had lasted twenty-four hours. On palpation the bladder could be felt distended nearly to the umbilicus. He was suffering too much to object to the passage of a catheter which I attempted, but was unable to accomplish as the instrument seemed to come in contact with some hard substance. I ordered his immediate removal to the hospital, where by external urethrotomy I removed a small calculus about the size of a bean. On withdrawal of the calculus a small dark looking stem, came with it, which stem was about two inches in length and proved to be a small twig from a tree. The stone searcher on introduction into the bladder showed that a calculus was present therein.

The bladder was washed out with boracic solution and urotropin administered for a few days when on suprapubic section I removed a phospatic culculus weighing about three drachms. The nucleus of the calculus was a piece of a small

branch of a tree similar to that of the stone removed from the urethra. A catheter was introduced into the vesical wound and retained there for two weeks, and the patient left the hospital in about a week longer, cured.



On examination of the photograph it will be noticed that the calculus had formed upon the twig inside the bladder and that either a much smaller calculus had formed in front of the large one and the twig had broken between the two, and then lodged in the urethra, or the twig had broken in the bladder and been carried into the urethra where it rested long enough to form a second calculus. The photograph possibly explains the hesitation on the part of the patient to submit to an examination.

A PENETRATING WOUND OF THE AXILLARY REGION.

On August 25th, a patient, J. R., was admitted to the hospital with a history of having been injured two days previously while assisting at a "barn raising." He had been holding a large crow-bar against an upright with the smaller end of the bar resting against the front of his right shoulder. A large

"Bent" behind suddenly fell forward, and, striking him on the back drove the crow-bar through him. As his body was wedged in between the "Bent" and the frame, a fellow-workman seized the end of the bar projecting behind, and pulled the whole length of the bar through him.

On examination I found him conscious, with a temperature of 99° and complaining chiefly of his hip, which he said was "strained." Under anaesthesia I explored the wound and removed some pieces of the scapula, and on inserting the finger into the anterior orifice (situated about two inches below and a little inside of the coracoid process) could feel the axillary artery pulsating on the outer side of the channel. The crow-bar had perforated the pectoralis major and minor, had opened up the axilla proper, and traversed the sub-scapularis, the scapula and infraspinatus. No foreign substances could be felt in the wound, and so, after thoroughly douching it with bichloride solution, a drainage tube was inserted through the hole in the scapula into the axilla, and the anterior orifice plugged with gauze. The hip was found to have been dislocated—dorsum ilii, and, after reduction, the patient was removed to his cot. Convalescence was uneventful—the temperature never rising above 99°, and in four weeks he left for his home. This case is interesting in view of the opening up of the axilla by a dirty instrument such as a crow-bar would likely be, and yet no sepsis result; and again, it shows how important structures may sometimes escape injury, for in the above case the end of the bar was at least two inches square and yet apparently there was not the slighest injury to the important blood-vessels, the plexus of nerves or its branches. No doubt the latter fact was due to the upper pointed end of the bar entering first, and the lower and larger end simply pushing the structures apart.

D. E. MUNDELL.

BOOK REVIEWS.

Practical Diagnosis.—By Hobart Amory Hare, M.D., B.Sc. Lea Brothers & Co., Publishers.

This work contains 623 pages and is illustrated by 205 engravings and 14 full page plates. The work is divided into two parts. The first part deals with the manifestations of disease in organs and the second part with the manifestations of disease by symptoms. In the first part the author treats of the evidences of disease which the physician may detect for himself by examining the face and head, the hands and arms, the feet and legs, the tongue, mouth, pharynx and oesophagus, the skin, the thorax and its viscera, the abdomen and the abdominal viscera, the blood-vessels and pulse, the blood, the urinary bladder and the urine, the bowels and faeces, the eye. Under each of these headings the author treats not only of the signs of disease to be detected by an examination of these parts but also goes fully into the methods of examination to be adopted for each tissue and organ. This part of the work is very complete and will be found to be of great service to the student of medicine.

In the second part of the work the significance of such symptoms as chills, fever, subnormal temperature, headache, vertigo, coma, unconsciousness, convulsions, hiccough, vomiting, dysphagia, cough and the characteristics of expectoration, pain, tendon reflexes, muscle tone, and speech, is pointed out. The book is full of valuable information, systematically arranged, and is well calculated to be of service to the student of Medicine as well as to the busy practitioner. The book well deserves its title, *Practical Diagnosis.*

The Diagnosis of Surgical Diseases.—By Dr. E. Albert, translated by Dr. Robert T. Frank. D. Appleton & Co., Publishers.

This work consists of 407 pages and has 53 illustrations and is divided into 39 chapters. The matter of the book is

systematically arranged and gives the most modern methods of diagnosis. The work is one that can with advantage be placed in the hands of Medical students and will be found most useful to the busy practitioner.

Physical Diagnosis.—By Egbert Lefevre, M.D. Lea Brothers & Co., Publishers.

This work which is illustrated by 74 engravings and 12 plates deals with the methods of physical examination of the thoracic and abdominal organs. The matter of the book is concise and yet explicit, and while the author does not pretend that his work is a treatise on Medical Diagnosis the methods of physical examination are fully and clearly explained and the clinical significance of the signs of disease is pointed out. The author has given a few tables which will be found by the student to be valuable aids to memory in the differential diagnosis of diseases somewhat resembling each other in their physical signs. We heartily recommend the work to the beginner in the study of Medicine.

THE MEDICAL DEPARTMENT OF QUEEN'S UNIVERSITY.

TEN years ago the Medical Faculty of Queen's University was re-organized and once more became an integral part of the University. During that short period great changes have taken place and great advances have been made. Drs. Henderson, Dupuis, K. N. Fenwick, Saunders, Cunningham, T. M. Fenwick and V. Sullivan who held positions on the Faculty have ceased their labours and been called to their reward. Dr. Fowler who was a member of the Faculty which was first formed forty-nine years ago, has retired from his active professional duties.

The improvements in the building have been many and have resulted in making it suitable for the teaching of modern Medicine in all its branches. The building has been increased one-third in size and laboratories have been fitted up for Physiology and Histology, for Pathology and Bacteriology and for

Materia Medica and Pharmacy. Enlarged, improved and well lighted rooms have been provided for the practical study of Anatomy. This has been done at an expense of about $12,000, and the whole burden has been borne by the Medical Faculty.

The number of prizes open for competition among the students has been increased. The number of House Surgeoncies at the Kingston General Hospital is now three, and the position is tenable for one year after graduation. The Chancellor's Scholarship, given by the Chancellor, and the Dean Fowler Scholarship founded by the Faculty and the Medical graduates have been established. Besides these numerous prizes for work in particular departments are now awarded each session upon the results of the University examinations.

The attendance of students has vastly increased. During the session of 1892-3 there were in attendance 108 Medical students. This session, ten years later, there will be in round numbers 200.

The changes on the Faculty, in the building and in the number of students has been accompanied by changes in the methods of teaching. The didactic lecture is gradually being displaced by practical work in the laboratories and at the bedside. This change in the method of teaching in itself necessitates more accommodation, and the greater number of students makes an increase in accommodation all the more imperative. Notwithstanding the fact that the Faculty at their own expense increased the accommodation by one-third it is still inadequate. The increase which has taken place in the number of students and the necessity for greater laboratory room which has so developed in the past ten years, render more room an absolue necessity. The Faculty has done all it can do and more than it could have been expected to do. Who will step into the breach and provide the necessary building? It must be provided or the work of the Medical Faculty i.e., of the University, be hampered and curtailed.