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THE

MONTREAL MEDICAL JOURNAL.

VOL. XXIII. MAY, 1895. No. 11.

Original Address.

VALEDICTORY ADDRESS DELIVERED AT THE CONVOCATION FOR CONFERRING DEGREES IN MEDICINE, McGILL UNIVERSITY, APRIL 4TH, 1895.

BY J. G. ADAMI, M.A., M.D., (Cantab.) M.R.C.S., Eng.,
Professor of Pathology in the McGill University, Montreal.

"*Caute, caste et probe.*" SPONSIO ACADEMICA.

GENTLEMEN OF THE GRADUATING CLASS,

This crowded hall, the honoured figure of our presiding Chancellor, the old well-known row of professors on the daïs, the Dean and his report of the results of the session's work, the Registrar administering the oath, the capping, the speeches, the cheers, the good humoured chaff—all these have become familiar to you in the years that have gone by since first you entered McGill. You have yourselves saluted year after year of your seniors, have seen the graduates of our Faculty pass out from the university into the universe, have sped the parting guests. To-day to you this old familiar scene must appeal with an altered and deeper significance. Now the supreme moment has come to you as in your turn you become the occasion of the ceremony, as you are about to leave us and test yourselves against the larger world, each endowed with the

"exeat" of our University. Moments such as this in the lives of each of us are critical moments. Marking, as they do, the transition from one epoch to another, they are for each of us, individually, rubricated and historical. All these years you have been preparing yourselves for what is to be your life's work. To-day you stand upon the threshold of the entrance into that work.

I would very willingly this day have seen you receive the "send-off" from one of my colleagues occupying a higher position in the Faculty than I, one who from his experience has a greater right to speak, a greater certainty of appealing to you on this which to you is so critical, and if you are as other men are, so susceptible a moment. Nevertheless, if other words would touch you more surely I trust that the fibres of your mind being high strung, some sentence or two of what I am about to deliver to you on the part of our Faculty may strike a chord thereon, so that in the years of the future there may still surely remain with you memories of these last moments spent under us here at McGill. of the first moments of your existence as fully qualified medical men.

It is but natural that standing on the threshold you look forward into the future. What is that future to be? How are you prepared to face the world? How are you to carry yourself in it? What are to be your ideals, what the goal towards which you strive? These are questions you must all be asking yourselves, and it will be well if you start on your journey armed aright and with clear knowledge of the motives that are to guide you.

One thing may, I trow, be taken for granted, namely, that you have selected your profession for higher motives than that of making a livelihood; if you have not, then of all men you are to be pitied.

There is a very clear "call," as some sects express it, to medical work. I have never known a successful medical man who has not wholly and entirely loved his work—I doubt if he exists. The true medical man takes to medi-

cine instigated by a profound liking for the subject—almost if not quite by instinct—and that being so, to the true medical man the fact that his profession will assure him a fair competency and independent position is and must be a secondary matter.

No profession, as you know full well, makes greater calls upon its followers than that of medicine. In season and out of season you are liable to be called upon—or more truly every hour of the twenty-four from year end to year end is the doctor's season. Not only is your time not your own, but each case that presents itself demands honest thought and the fullest endeavour on your part to put forth all that you possess, irrespective of what the monetary result is to be. Love for the work is and must be first. This may be an instinct wholly unassociated at first with any idea of doing good, but the very liking and desire to engage in the work must lead you to seek every opportunity of practice and so, willingly or unwillingly, the good is done.

Of old it was said that where there are three medical men there are two atheists. Most assuredly this is not so. It is only true that the habit of independent thought and of striving to determine the why and wherefore of things, which is second nature to the physician, is not in accordance with the straitest theology, and tends often towards heterodoxy. Nevertheless, no profession demands from its followers the more constant exercise of practical Christianity. You have entered into a profession of which it is the noble tradition dating back centuries to the school of Salerno, and yet earlier, that the call of the afflicted and needy is to be attended to, and attended to with no second thought. To this extent the exercise of your profession is pure religion. It rests with you to preserve it undefiled. This is the *religio medici*, whatever else be added thereunto by the individual. The medical life is the practical exercise of this religion. If your main thought in looking to the future is that medicine will bring you money and

position, that attitude of mind alone makes you traitors to the traditions of your profession—you would better renounce the labours and the results of all these years and enter into some trade, adventure or other concern. There you can be honest to yourself and your employment. Anything but medicine for such an one. For such an one *esto anathema.*

You have entered into the noblest and freest of all the professions. I say this unhesitatingly. Law may be noble, but there is no tradition among its followers to do gratuitous good to other than to lawyers. The life political may lead to the well-being of the whole community, but most of its good is destroyed by the necessity of giving up to party what was meant for mankind. The church, with its lofty work, may question the right of medicine to occupy the noblest place; yet, while the church holds many, very many men of conspicuously noble life, I doubt myself whether its bonds do not for many render life ignoble Each of us in the course of our existence comes across some few (but how few !) of conscience so pure, mind so serene and faith so natural that for them the great problems of existence seem to solve without difficulty, in fact, seem not to be problems at all. Most of us mortal men, I fear, if we think at all and utilize or strive to utilize the minds that have been given to us, belong to that purblind race.

> Here, thro' the feeble twilight of this world
> Groping, how many, until we pass and reach
> That other, where we see as we are seen.

And groping and seeing things darkly, our opinions as to these things vary so much that what at one time seemed true, at another seems false. Thus, if a talent or talents of thought have been entrusted to them the time must come to most in the ministry when either the results of thinking lead outside the limits of those articles of faith they have sworn to maintain unswervingly, or the fear of transgression of the bounds inhibits thought and renders the man a caitiff to himself and his prerogative. Lofty

and noble as are the ends, the bonds, the necessary bonds, for most are weakening.

Our profession is girt about with no such limitations. We can think freely, we can and should employ any and all means that prove themselves good. As men and free agents we are untrammelled in the exercise of our life's work. The only serious doubts that can come to us in labouring faithfully are as to whether we fulfil our mission and do aright when we save sundry who, continuing to exist, will have feeble and diseased progeny, and will lower the quality of the race, or when with unceasing care we oil the lamp of life in those to whom euthanasia would bring abiding rest. But the remembrance of our duty stills these doubts—our duty is to save. It is not given to us to determine who is of value and who is valueless; that is not in our hands. We have the consolation that while in a few cases we may seem to be aiding and abetting the degeneracy of the race, in general by our work and its influence, we are raising the standard of existence, lengthening the life of each and making the race healthier.

If, then, our profession be noble, it behoves each one of us and of you to do nothing that shall degrade it. Its dignity and high standing depends upon the dignity and standing of each member, and each one that lowers his individual standard lowers medicine. With Bacon, "I hold every man a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to be a help and ornament thereunto." Thus while the fullest freedom is yours to do what seems good in your work, as workers, and in the manner of your work your duty to the body corporate of medicine must ever be kept in remembrance, and faithfully acted upon.

It may be that at times you will find it hard to act up to your duty and that the trial of your loyalty may be a sore trial. I say this advisedly. It may, for example, seem hard to you that men in trade can compound medi-

cines and sell them far and wide to a gullible public and amass fortunes thereby without being under the necessity of publishing at the same time their composition. Verily they have their reward. But do you ever keep in remembrance the higher self-denying precept of our profession that whatsoever you discover for the good of suffering humanity must freely become the property of those who, with you, are striving to allay disease. Acting on this same precept shun all alliance, direct or indirect, with those dealing in secret cures or possessing nostrums for the manufacture of gold.

It may be that feeling yourselves strong, and finding yourselves unappreciated by your fellows, you may in bitterness believe them to be combined for self-protection to prevent your rise. Do not permit such thoughts to gain the ascendancy, but in humility commune with your own hearts and seek to find what it is in yourselves or in your conduct towards your brethren that has rendered you unpopular. Depend upon it the fault or failing originates in you. Do not as you honour your profession render yourselves unworthy thereof by advertising to the public, or place yourselves outside the pale by playing upon the tenderest feelings of the laity. It is so easy to do that. Do not take steps which, were they successful and were they followed by the rest of your professional brethren, would absolutely prevent students from attaining that knowledge which has been freely imparted to you. Freely have ye received, freely give. Let it never be even suggested that for selfish aims you have sought to bar the gates of knowledge. The doctor must not only be *sans reproche*, he must be above suspicion.

It may be that temptation comes to you to leave the bulk of your fellows and gain a *clientèle* and make a more rapid fortune by pursuing some exclusive method of treatment. Alas for poor humanity! You may be tempted to attract patients and a name to yourself by electro-magnetism. You may be tempted to gain a bubble reputa-

tion, and float into prosperity upon cold water ; or finding your prospects along the ordinary path to appear at first infinitessimally small, on the principle that like cures like you may be tempted to employ the infinitessimally small to better your condition.

To travel yet once more the old familiar ground : In studying the processes whereby the organism reacts towards and seeks to repair injury, if you have learnt one lesson it is this, that nature is not exclusive, she does not employ one means of cure. It is not by cells of one order alone, by phagocytes, or by leucocytes in general and only leucocytes, or merely by the reaction on the part of the cells of the tissue, or by nervous changes alone or by altered temperature, or solely by the chemical and mechanical action of the exudate that repair is effected. Nature employs all means at her command to antagonize the irritant and to effect healing. The cells of the body fixed and free play their part, the nervous system aids the process, the bodily humours render efficient help, modifications in the vessel walls and blood stream are valuable auxiliaries. The lesson that you have learnt is that nature employs diverse processes, now one more particularly, now another, according to the needs of the moment, but none exclusively. If modern research has accomplished nothing more, it has most surely established this fact. And we, if we are possessed of the sincere desire to benefit our patients, must not, nay cannot, narrow ourselves down to the fanatical employment of one solitary means, or the guidance of one restricted rule ; we must be broad minded. If water will do good at a certain stage, employ it—if a good honest dose of castor oil, employ it—if pillules of a sort are of proved merit, employ them—if stimulation of the nerves, then stimulate. He who holds to the exclusive or even the predominating use of but one means of treatment writes himself down—well—in one or other of a humiliating alternative of terms.

It may seem, gentlemen, that I have spent too great a portion of the short time at my command in dilating upon

this matter of medical morals. But as I said before I have done so advisedly. Knowing you, I do not think that there is a great likelihood of any of you becoming conscious transgressors of our code. Yet year by year in the yearly growing bitterness of competition, the tendency is becoming more and more marked for the weaker brethren of our profession to seek to copy examples of commercial success—and, frankly, I fear what the future may bring forth. There is all the more need that you as graduates of this University hold high the torch of professional rectitude. Apart from, though akin to what is expected of you as medical men, there is ever to be kept in mind what devolves upon you as graduates. According to the usage of the mother country this day the University in conferring upon you its degree of Doctor has with it given to you the title of "gentleman." That title is now yours by right. Remember this, but do not be satisfied with the mere title. Be gentle in word, gentle in thought, gentle and kindly in deed, bearing this grand old name without abuse. Let this thought fortify you in the hour of trial if ever it comes to you—that apart from your rank as medical men you are graduates of a University, and that University, old McGill.

Thus much, then, concerning the armour wherewith you are to gird yourselves and the goal whereunto you are to strive. Now for a few brief words upon your bearing and the setting forth on the journey.

Let your first steps be very cautious. Now, when all these years of instruction at school and college have come to an end you may very naturally be thinking that you know much. But instruction is one thing, true knowledge quite another. You may be crammed with principles, with facts and the deductions from those facts; but you have had little time to recognize the application of those facts little experience, little time to assimilate, and until they are properly digested and assimilated they are of little value. Believe me when I say that you know next to nothing. Forgive me for putting it so bluntly. We, your teachers, have

travelled over the same road. You will find it out to your cost, and to your patients' cost, during the next year or two—only now do you begin to gain full knowledge. Do not make that most unscientific mistake of thinking that from the voracious caterpillar constantly cramming food into its insatiable maw you emerge forthwith into the perfect and lovely *imago*. That is not the case—at least, not among the higher insects. You have to pass through the chrysalis stage, a stage of humble suspense, in which the results of all the cramming are refined and rearranged. We have done our best for you—we have fed you with food that we have endeavoured to make assimilable, even if at times it has been as highly concentrated as those little lozenges which are said to contain each one the nutritive ingredients of a whole mutton-chop. Noble minds and generous have come to our aid and have (if they will permit the homely metaphor) supplied us with the necessary culinary utensils. But while we may have been able to peptonize some of that food, to give it to you in a more or less digested condition, the final stages of digestion and the process of assimilation have of necessity to be performed by you yourselves, the salt of experience aiding.

Do not set out with the belief that, because you know your Osler and your other text-books and can repeat your lecture notes by heart and have followed diligently every operation in the theatre, you are therefore prepared to diagnose and master any and every case that presents itself. This may seem an obvious and unnecessary remark, nevertheless I have followed so many budding house surgeons and house physicians on this side the water and across that I deem it wise to note it. As you have learnt in your lectures in physiology, so many factors are concerned in the proper carrying out of each of the bodily processes, and their interrelations are such that it is ofttimes impossible to predict or fully explain the results of variation in any single factor. So it is also in pathology, in the study of disease. Every case varies and departs in some point or points from the classical symptomatology,

and diagnosis, you will find, is not to be accomplished by simple rule of thumb. In the words of a great modern poet let me impress upon you that

They see not clearliest who see all things clear.

Thus it will be that if you observe carefully, considering each case by itself and using your own judgment, apart from what we have said, or X. has said, or Y. has said, though stimulated by these dicta, you will develope, and in the process of development you will discover that X. and Y. and we have ofttimes been mistaken. We have, it may be, told you much that is erroneous, but never mind. We have done our best according to the light that is in us, and if by our mistakes, as by our sound teaching, we have led you to think and to observe and to record, then through you advance is made and the world is the gainer.

Do not think that the giants of the past and the great ones of these latter days have accomplished everything and that there is no advance left for you to achieve. Ours is a progressive art. However small you may be and humble in your own conceit console yourselves: The dwarf perched on the giant's shoulder sees further and sees more than does the giant.

As of old our architype Hippocrates exclaimed in the fulness of his experience, "short is our life and our art is long." * You have much before you and little time in which to accomplish it. I will not detain you longer.

That you may fare well and through you others may be bettered, that you may earn for yourselves names of honour and of respect from those among whom you minister, that you may earn for McGill, your old Alma Mater, ever increasing reputation and a fame known *super æthera*, that is our earnest wish. On behalf of the Faculty I say to each one of you, VALE!

* I am a little dubious as to whether Hippocrates is rightly credited with the original of *ars longa, vita brevis*, for my authority is the "Life and Opinions of Tristram Shandy, Gentleman," vol. ii., chap. xxxiv. of the two volume edition, and during the last few days I have had no time to verify the statement. Yet if the Rev. Mr. Lawrence Sterne was apt to digress and be discursive, he was a fair scholar.

Original Communications.

NOTES UPON CARDIAC HYPERTROPHY.

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I shall, I think, best satisfy you, and at the same time myself, if what I contribute to this evening's discussion takes the form of a series of notes upon the experimental pathology and the anatomy of cardiac hypertrophy, rather than that of an academic survey of the subject from the clinical standpoint. Frequently, it is true, I must of necessity illustrate what I have to say by reference to clinical history, but, on the whole, I shall leave the clinical aspects to be dealt with by those more capable.

In the first place, if we study the causes of hypertrophied heart, whether of hypertrophy of one or both sides, we see this that reading the clinical history of these cases the assigned causes of hypertrophy may be summed up under the heading of *increased work*. This one heading may be subdivided into three, increased work due to resistance from within, increased work due to resistance from without, increased work due to nervous stimulation and augmentor action. I shall not discuss this last subdivision, because frankly we are ignorant how far the hypertrophy that occurs in exophthalmic goitre and allied conditions is due to heightened blood pressure, and how far it is secondary to excitation of the accelerators or augmentors.

Of the increased resistance from within, or increased tension, the main causes are, heightened pressure in the arterial blood stream, and secondly, obstruction to the onward passage of blood within the heart itself, by stenotic diseases of one or other orifice. Of resistance from without, the one great cause is pericardial adhesion. To-night we have, as far as possible, to leave out the subject of valvular disturbance, and I shall neglect nervous disturb-

ances. There is still the large field of hypertrophy due to increased arterial pressure, and the pericardial adhesion. In all these cases, the individual fibres of the heart muscles of the affected regions have to contract under increased difficulty, they have to carry or contract against a greater load, and as a result of this, just as is the case with the skeletal muscles, with the muscles in the blacksmith's arm, and the muscles of the body in the all-round athlete, increased work brings about increased growth—brings about, that is to say, hypertrophy of the muscle.

Into the subject of the nature of this increased growth I shall enter in a few minutes' time, at present I wish to carry a word further this parallel between the behaviour of the cardiac and skeletal muscles, under circumstances in which the load is increased. If you take a skeletal muscle, for example, the gastrocnemius of the frog, so dear to the physiologist, and observe its contraction with gradually increasing loads, there are two points especially to be made out. In the first place the greatest amount of work is not performed with the smallest load, but there is a certain medium load with which the distance through which the load is pulled multiplied by the weight of the load gives the biggest result. This product of weight moved and the distance through which it is moved is the work done by the muscle. The most work, therefore, is done with a medium load. The second point is that with increasing weights fastened or brought to bear upon the muscle, that muscle in its resting state becomes more and more elongated, and with regularly increasing weights attached the shortening attained by the contracted muscle constantly diminishes. Or, to put the matter in a slightly different light, and to combine these two statements of fact, although with a certain medium load the greatest amount of work is done, nevertheless with that medium load the muscle in contracting does not attain to the same amount of shortening as it does with a lesser load.

Let me now apply these observations to what is found in the ventricular muscles of mammals. Experimentally,

the amount of work performed by the ventricles of the mammalian heart can be increased by ligaturing the aorta with a sliploop ligature, and drawing this ligature more or less tight, according to need. [This in an animal that has been narcotised and curarised and subjected to artificial respiration, the heart being exposed by making a window in the ribs.] In such a case as this, as shown by Professor Roy and me,* the behaviour of the cardiac muscle can be observed and recorded by an apparatus, of which I give a rough diagram. (See Fig. 1.) The ends of this apparatus are attached to the surface, say of the left ventricle, by fine threads, and now it is possible to observe upon the recording drum the extent of contraction of the portion of muscle between the two points under different pressures within the heart. Narrow the aorta by drawing the ligature tight and the pressure is increased. Under these conditions it is found that the ventricular muscle reacts exactly along the same lines as does the gastrocnemius of the frog.

Similar results are obtainable if, instead of increasing the pressure in the arterial system by narrowing the aorta, we increase the work of the heart by increasing the amount of blood passing through it, either temporarily, by pressure upon the abdomen, whereby a large quantity of blood is expelled from the abdominal viscera, or by injecting into venous circulation some few hundred cubic centimetres of defibrinated blood. The results in all these cases are the same. By the instrument just described it is easy to see that the heart is more filled in diastole, so that the two ends of the levers are pushed further apart, and that in systole the ends do not approximate so nearly as in the condition when there is less resistance or less blood pouring through the organ.

It is seen from these observations that with increased pressure within the ventricle the wall expands in diastole. There is dilatation of the heart. But with the increased load to contract against the fibres do not shorten to the

* Heart beat and pulse wave. *Practitioner*, February, 1894, p. 81.

same extent; that is to say, with increased work of the heart there is, necessarily, accompanying the dilatation in diastole, a dilation in systole. All the blood is not expelled in systole. There is of necessity *residual blood*, as Roy and I termed it, in the ventricular chambers.

There is a general belief that the healthy heart, even

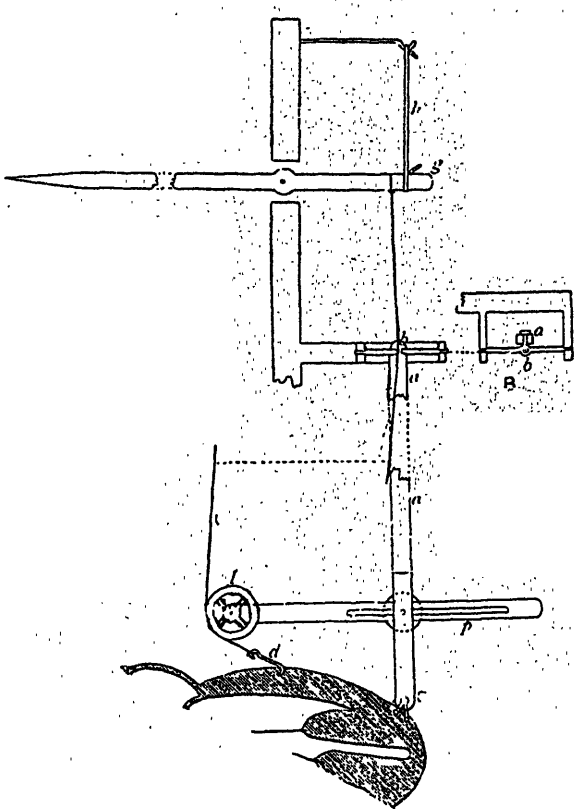


FIG. 1.—Myocardiograph for mammalian heart shown semi-diagrammatically. The light vertical rod *a*, which for convenience of space is shown shortened in the figure, is slung from the pivots which are represented in section as seen from above B. This arrangement allows the rod *a* to swing freely, the centre of rotation being the small hole at *b* (in B) The lower end, *c*, of this rod is fixed to the surface of the heart-wall as seen in the figure. To obtain tracings of the heart-wall, the small hook *d* is inserted in the visceral pericardium at a convenient distance from the end of the rod *a*. To this hook is attached a strong silken thread, *e*, which after passing round the light grooved pulley *f* is conveyed upwards through the small hole *b* to the lever *g*, being kept taut by the fine rubber thread *h*.

under conditions of increased work, contracts completely, so that the chamber is emptied at the end of systole. From what I have said it will be seen that this is not the case. One can go further and prove for one's self that even under ordinary conditions the mammalian heart does not completely expel all the blood within the ventricles. By taking a dog that has been curarised and subjected to artificial respiration, opening the chest wall, making an incision at the very apex of the left ventricle, so as just not to completely enter the cavity, then it is easy to push the little finger into the cavity through the thin apex without the loss of a drop of blood. The heart action is not recognisably disturbed by this procedure, and it can be felt that while the walls of the ventricle in the lower two-thirds up to the apices of the papillary muscles, close completely round the finger, there is a clear space in the upper third which is not and cannot be emptied of blood.

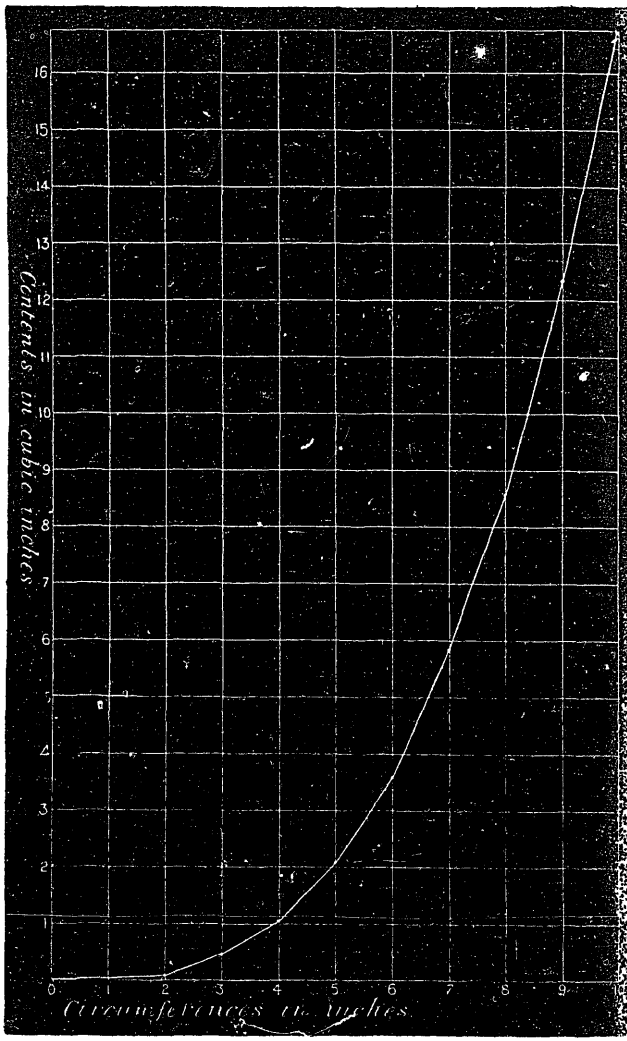
Although it may seem at first sight to have no direct bearing upon the subject of this evening's discussion, nevertheless it is worth while to make a few remarks upon this subject, inasmuch as it is so intimately associated with conditions of hypertrophy without valvular disease. It is quite possible that where there is increased work to be performed by the heart, there is some economy of the action of the organ when there exists a certain amount of residual blood, in and dilatation of the ventricles. Taking the ventricular chamber as a sphere,* there is this to be noted concerning the relationship between the circumference of the sphere and its contents, namely, that as a sphere expands its cubic contents increase out of all proportion, I was going to say, to increase in circumference, or more truly, the ratio between increase in cubic contents and increase in circumference is by no means an arithmetic ratio.

If the circumferences be taken as abscissæ, and the corresponding volumes as the ordinates, the curve of succcsive

* The sphere is the nearest geometrical figure that can be employed here for purposes of illustration.

values is what is known to mathematicians as a cubical parabola. From this it follows that a degree of shortening of

Fig. 2.



Curve representing the relationship between the circumference of a sphere and its volume, with successive unit increments of circumference.
Ordinates = volume in cubic inches.
Abscissæ = circumference in inches.

the fibres of the heart wall sufficient, let us say, to reduce the circumference of the ventricle one inch, will cause a greater diminution in *volume* (a greater output) the more dilated the ventricle is at the beginning of its contraction. For example, a diminution of the circumference by *one* inch of a sphere whose circumference is *ten* inches causes a diminution of the volume or an output, in the case of the heart, equal to 4.5 cubic inches, while a diminution by *one* inch in the circumference of a sphere *five* inches round causes a diminution or an output of only 1.027 cubic inches, although in the first case the circumference was reduced only by one-tenth, while in the other case it was reduced by one-fifth. That is to say, if we have a dilated heart the fibres will need to contract a very small amount, in order to expel a given amount of blood, compared with the amount they would have to contract in the normal undilated heart.

There are other factors to be taken into account, it is true, and Roy and I went a little into this subject in our paper published in the *Philosophical Transactions.** All that I wish to do here is to point out that it is possible that in a hard-working heart a certain amount of dilatation, with presence of residual blood, by diminishing the extent which each fibre is called upon to contract, may really be an economy to the organ as a whole.

It follows from these observations that *hypertrophy is never primary, dilatation always precedes hypertrophy.* This was recognized as most probable by Hilton Fagge; few other writers have laid stress upon the point. If, however, the heart muscle is well nourished, where this dilatation is due to increased work, by Paget's law hypertrophy ensues, and the numerical hypertrophy or hyperplasia of the ventricular muscle fibre will have the effect of lessening the load of each individual fibre. Consequently, with a lessened load, each fibre will contract more completely and the dilatation will tend to disappear. Where this is the case we have what is known as simple hypertrophy.

* Phil, Trans. of the Royal Society, London, 1892.

There can be no doubt that in the early stages, where ample reserve force and good compensation are present, this simple hypertrophy exists and may persist for years. But I would add that in the post-mortem room it is more rarely to be seen than is generally accepted. If a hypertrophied heart, say of Bright's disease, without valvular lesion, be examined within a few hours after death, in very many cases we appear to have this simple hypertrophy. If, however, time be given for the rigour and contraction of the muscle to pass off it is found—that at least is my experience—that the cavity of the left ventricle is distinctly larger than the cavity of the normal heart. I would say that only in those cases in which death has occurred from some intercurrent disease, and not from one of the cycle of diseases associated with cardiac hypertrophy—only when death occurs before the final stage of the disease of which cardiac hypertrophy is an integral part—do we obtain evidence of real simple hypertrophy. *Eccentric*, and not simple, hypertrophy is the rule; that is to say, hypertrophy associated with definite dilatation of the ventricular cavities.

As for the concentric hypertrophy, which is said to be observable in non-valvular disease, I feel more and more assured that it is falsely so termed; there is no such thing as true concentric hypertrophy, for the condition implies a lack of economy in the work of the organ, a most unnatural lack; it implies that the ventrical in contracting expends a large part of its energy, after expelling the blood, in squeezing up the more internal fibres. Only within the last fortnight I obtained a specimen of so-called concentric hypertrophy. The patient, an old woman of eighty, in Dr. Stewart's ward at the Royal Victoria Hospital, died from cerebral apoplexy, following upon extreme atheroma of the aorta and the main vessels; there was, in addition, atheromatous stenosis of the aortic valves, both conditions favouring the development of hypertrophy, with dilatation of the left ventricle.

The old woman had lingered some days in a comatose condition, with presumable lowering of the arterial blood pressure. In addition the tone of ventricular muscle had been in all probability considerably increased by digitalis. At any rate, at the autopsy a very few hours after death the left ventricle was found hypertrophied; and instead of being dilated was so firmly contracted that the only cavity left was immediately around the chordæ tendineæ. The thickness of the ventricular muscle at the junction of the lower and middle thirds was 20 mm.: that is to say, there was moderate hypertrophy. However, on coming to observe this heart the next day, the concentric hypertrophy had quite disappeared. With the passing off of rigidity there was a relatively large cavity left behind.

Where the left or right ventricle alone is affected the condition of the ventricle may be one of either simple or eccentric hypertrophy. Where, on the other hand, as Walshe noted more than thirty years ago, there is general hypertrophy of the organ, there hypertrophy is *always eccentric.*

A little consideration shows why this must inevitably be the case. So long as there is simple hypertrophy (hypertrophy without dilatation), so long the mitral valves remain competent, and there is no regurgitation into the left auricle, no increased work for that organ to do, no hypertrophy So soon as the left ventricular muscle begins to fail and to be unable to contract properly under its load, dilatation ensues, and with this dilatation expansion or giving way of the muscular ring around the mitral orifice, and with this, relative incompetence of that orifice. It is only when this relative incompetence occurs, or when from other causes the mitral valves fail to perform their duty, that there is any possibility of the other chambers of the heart being called upon to do increased work. Thus it is that general hypertrophy of the heart demands or is associated with eccentric hypertrophy of the left ventricle.

Time forbids that I should go more fully into this subject or do more than point out that relative incompetence

of the auriculo-ventricular valves is more frequently found at the post-mortem than it is diagnosed during life. Relative incompetence, therefore, is not necessarily indicated by the presence of a murmur.

I cannot here enter fully into the histological nature of hypertrophy, although perhaps as a pathologist it might be expected that I should say some words upon this point. I will only say that while one can, in certain cases of hypertrophy, make out clearly that the individual fibres have undergone a definite increase in size, it is far more common to note, and of this there can be no doubt, that there has been an actual numerical increase in the fibres. This increase appears to be general throughout the ventricular wall and is possibly, nay probably, due not only to a new growth beneath the endocardium especially, but also to a splitting up or division of pre-existing fibres. It must be remembered that the heart muscle fibre is not a single cell, but is a compound, the result of a fusion of several cells into one individual unit. As a consequence of this it is possibly more easy for the fibres to split up into independent territories without undergoing temporary derangement of function than is the case with the cells of those tissues formed of isolated cell units.

To pass on now to certain aspects of this subject of hypertrophy more immediately in connection with this evening's discussion, I would point out that of the cases of hypertrophy without valvular lesion, we have to consider in the first place increased resistance through the column of blood. This could be brought about by increased amount of blood to be propelled, or, in the second, by increased resistance to passage in the arterial system. Of these two the first may exist as a constitutional condition, but the more one studies the less assured does one become that there is such a condition as general plethora unless these case be regarded as true plethora in which (as in German beer drinkers) there is oft repeated flushing of the circulation with imbibed fluid. Of increased resist-

ance in the arterial stream the reverse would appear to be the case, and with further studies of blood pressure in the arteries one begins to see that this plays an extremely important part. The hypertrophy following upon not only gouty conditions and senile artero-sclerosis, but also upon acute rheumatism, chorea and chlorosis may be present with or without lesion of the aortic or mitral valves of sufficient intensity to explain its extent; so that in all these cases we have to fall back upon increased blood pressure as a cause of hypertrophy.

Increased blood pressure in itself is capable of setting up a vicious circle of which one segment may be hypertrophy.

In the first place it leads to an increased nutrition of the walls of the arteries, increased nutrition leads to increased connective tissue growth of the walls, the increased fibrous tissue of the walls leads to contraction and increased rigidity of those walls, the increased rigidity leads to increased resistance to the passage of the blood current, the increased resistance required increased propulsive power on the part of the ventricular muscle, that is to say, increased work; the increased work of the heart leads to overgrowth and hypertrophy, and with this, heightened blood pressure and further increased nutrition of the walls. And now at last the stage is reached, this vicious circle continuing, in which either the walls give way or the heart.

The longer I study the pathology of the circulation—and during the last eight years I have given more time and thought to this than to any other branch of my subject—the more assured do I feel that increased blood pressure alone (however it be primarily brought about) is sufficient to explain the anatomical changes so constantly seen in arteries, valves and heart walls, without of necessity calling in chronic inflammation or specific agency. The changes I refer to are arterio-sclerosis, atheroma, and general fibroid thickening of the valves. Perhaps here again I am diverging from the main subject of this evening's discussion, but I say this as a connecting link with what I have just remarked and with what is about to follow.

While I am far from wishing to indicate that this is to be regarded as the sole cause of atheromatous and arterio-sclerotic changes, I hold that the changes I have mentioned can one and all be explained by the increased pressure within the vessels leading to an increased passage of fluid from the blood into the sub-endothelial layers of the intima, to an increased nutrition, and as a consequence to a proliferation of connective tissue in this region, which in itself as it contracts cuts off its own supply of nutrition, degenerates, and what is more, leads to degeneration of surrounding parts by cutting off their nutrition. The evil effects in arterio-sclerosis; with all its combined lesions, are not necessarily of an inflammatory origin.

Let us take now the hypertrophied heart. Time permits me to refer but briefly to the anatomical changes that may occur in it in the cases before us.

1. The overgrowth of the arterial walls may be associated with an increased tendency to the development of fibrous tissue in the immediate neighbourhood of the arteries, and thus a condition of so-called interstitial myocarditis may be set up; or

2. With an increased fibrosis of the arteries the narrowing of the channel may lead to incomplete nutrition of the territory supplied by each arterial twig, and as a consequence the muscle fibres at the periphery of the territory may be atrophied through lack of nutrition and be replaced by fibrous tissue. This is the so-called dystrophic sclerosis of the French school, and can frequently be seen more especially in the papillary muscles.

3. With the arterial disturbance there may be actual blocking of the atheromatous arteries, and so infarctous areas may originate, may undergo softening, may cause rupture of the heart or aneurism of the wall, or if the period of softening be successfully tided over, the replacement of the necrosed tissue leads to cicatricial development and disturbance of the normal contraction.

All these cases here mentioned inevitably cause interrup-

tion to the proper action of the remaining fibres and lead towards a final failure of the organ.

Another set of causes would seem to act along rather different lines, not so much of disturbances in the coronary arteries as disturbance in the quality of the nutrition, whereby the heart muscle tends to undergo fatty degeneration. In the uncomplicated case of hypertrophy, without valvular lesion, however, this fatty degeneration is rare; more frequent, according to the observations of Renaud, Browicz and Von Recklinghausen, there is a tendency for a sudden rupture of the heart fibres, from segmentation or fragmentation. It would seem as though, from the very careful observations of the last two, the weakened condition of the muscles permits some slight increase in the work done by the organ to bring about, not a local rupture, but a generalized separation of the fibres.

Possibly this segmentation may explain the suddenness of many cases of death in those with atrophied and dilated hearts. For my own part I cannot as yet see that it has been proved with absolute satisfaction that the fragmentation of the fibres is agonal or pre-agonal. Nor, looking back, does it seem to me that the most strongly marked cases that I have encountered of this fragmentation have been in cases of sudden death.

Lastly, to round off this paper, it is necessary to say a word concerning the hypertrophy that follows pericardial adhesion. Of this I may say that I cannot recall any case seen by me in which the hypertrophy was not markedly eccentric. Most frequently the hypertrophy has disappeared with, in its place, peculiarly extensive degenerative change.

EMPYÆMA.*

By J. G. Scott, M.D., Ottawa.

The pleura, like all other serous sacks, is liable to a variety of diseases, but we will confine ourselves to that known as empyæma or purulent pleurisy.

Empyæma is a collection of pus in the pleural cavity. Modern bacteriological investigation has almost conclusively determined that this progressive suppuration is due to the irritation of pyogenic bacteria and their products.

In pleurisy proper, or the non-purulent form, there is plastic and serous transudation, with formation of new tissue, but in the purulent variety, or empyæma, there is in addition, as Hare puts it, "a progressive shedding of embryonal endothelial elements which, with the migrating leucocytes and other formed elements of the blood, constitute the pus of the exudate."

From the nature of the pleural cavity, being a shut sac, it naturally follows that the admission of these bacteriological elements into the pleura, except in penetrating wounds, must be secondary to other pre-existing disturbances having pyogenic organisms or bacteria.

Causes.—The causes, then, of empyæma are bacteria, whether admittted from without through penetrating wounds of the pleura, or from within by contamination through the lungs, tissues or blood.

Empyæma may begin as a non-purulent exudation, and not being absorbed go on to suppuration and pus formation. It may be the result of accident by which the pleura is wounded from without, or by the injudicious use of a dirty instrument in aspirating the chest. It may be a complication of scarlet fever, or any other of the exanthems, of puerperal fever, pneumonia, pyæmia, etc.

Dr. Matas, in *Hare's Therapeutics*, recognizes four differ-

* Read before the Clinical Society, Ottawa, January, 1895.

ent kinds of empyæma depending on as many kinds of pyogenic bacteria, but it requires a bacteriologist to differentiate them according to this classification, and he, recognizing this fact, has further classified it according to the character of the exudate into four divisions, which may be detected by an ordinary observant student of medicine:

1. *A fibrino-purulent exudation*—This form has a large quantity of fibrin in suspension, either as flocculi or pseudo-membranes. It has a slightly greenish tinge. This form is characteristic chiefly of infantile empyæma and empyæma complicating pneumonia. I think many cases of so-called unresolved pneumonia are empyæmas of this class.

2. *A sero-purulent exudate*—The exudate may be turbid greenish, creamy colour or, if mixed with red blood corpuscles, of a chocolate colour. This form is found in empyæma of the infectious diseases or the contamination of ordinary pleurisy by an unclean instrument.

3. *The putrid or gangrenous variety* (recognized by their odour and appearance)—This form occurs in empyæma of puerperal fever, etc.

4. *The tubercular form*, which is not so easy to recognize, from the character of the exudate resembling the pus of a cold abscess. This is generally determined by the condition of the lungs being found as a complication of tubercular phthisis.

I believe we might add another form and call it a mixed form, where the character of two or more seem to blend together to form one.

Symptoms—It may be acute or chronic. The symptoms of the acute differ very little from those of acute non-purulent pleurisy. There are usually chills, pain in the side, short, dry, hacking cough, hurried respiration, and as the fluid increases dyspnœa occurs; there is dryness of the skin, rapid pulse, elevated temperature, ranging from 100° to 105°. The digestive organs are also deranged, anorexia, furred tongue, bowels irregular, sometimes constipation, sometimes diarrhœa.

The chronic begins in a somewhat similar manner to the acute, but in a few days the fever abates, except in the evening, when the temperature is raised, but not usually very high. Sometimes there is a vast collection of pus and still the temperature remains but a degree or two above the normal and persists for months, and sometimes under the same circumstances no chills occur. Anorexia is most marked.

Physical signs.—There is œdema of the affected side, and usually later on œdema of the lower extremities. Diminished movement on the affected side, dulness on percussion, enlargement of the side, displacement of neigbouring organs, especially the heart, almost entire absence of breath sounds, but depending on the amount and consistence of the fluid and consequent compression of the lung; but a positive diagnosis can alone be made by puncturing with a hypodermic needle or aspirator and withdrawing some of the fluid. And here I would remark that some of the plastic exudation or flocculi may block the needle and prevent the flow, but by using the stillet this can be remedied; this has happened with me several times.

Course and terminations.—Empyæma usually occurs on one side, but sometimes on both. One of my cases was bilateral of the tubercular variety.

It is claimed that once in a while the pus becomes encysted and reabsorbed. I never met with a case of this kind and I think they must be exceedingly rare. The usual course would be, if the surgeon did not interfere, a continuation of all the symptoms until either nature in her warfare with disease would predominate and a fistulous opening into the bronchi or through the chest wall occur and give exit to the pus, or more frequently the disease would triumph and the case go on till the wasting would become so extreme that the patient would sink from gradual asthenia.

Prognosis—In the first and second variety the prognosis is favourable, unless complicated with some serious disease, diabetes, Bright's disease, etc.

In the third form the prognosis is more doubtful. In the fourth variety I would never operate unless for the relief of symptoms, or unless the disease that caused it was in the incipient stage, for otherwise it must necessarily be fatal.

It is claimed, however, by Matas, Widal and others, that the pulmonary lesions in the early stage appear to be arrested by the removal of the pleural exudation.

Treatment—Matas beautifully expresses it when he says, "With the recognition of pus in the pleura the pharmacological resources of medicine must retire to the background and the aggressive intervention of surgery must dominate in the treatment."

The treatment must have for its object the removal of the pus, the prevention of a re-accumulation and the restoration of the parts to as normal a condition as possible. Osler has written an article on the natural cure of empyæma by fistulous opening.

It is true that cases do occur where the constitution will withstand the disease until nature, ignoring the surgeon, accomplishes what he should have at least assisted her in doing weeks if not months before. It is true that serious diseases do sometimes get well of themselves and the constitution be restored to its normal condition; but are we to fold our arms and wait for weeks, or perhaps months, and run our chances of such a result? It seems to me a very puerile way of doing things. As well might we wait and not interfere till nature has removed completely a sequestrum that has been thrown off from a diseased bone. I have seen two cases recover in this way, one by fistulous opening into the bronchi, and one of local necrosis of the pulmonary pleura. They were cases that had lasted for weeks and weeks before they came under my notice.

Some cases are reported as recovering after simple aspiration the first time, especially in children, but I have never seen it. I invariably in children aspirate, then wait a few days, and if it refills, as it has always done in my

cases, operate at once. In adults as soon as I detect pus I operate at once, having learned something from my first case.

I believe the secret of success is to operate early, keep the cavity clean and the wound open until all discharge ceases and use antiseptic precautions, although the latter is not indispensable. In my cases very little antiseptic precautions were used, still I would recommend them. In operating I always use a silver-plated drainage tube, although many use rubber.

My objections to rubber are that they easily get blocked up and when the chest wall is retracting they are apt to get occluded and are harder to keep asceptic; besides, by using rubber two openings in the chest are usually required, whereas only one is required with a silver drainage tube.

In making the opening the point of election is in dispute. I selected a point about a hand-breadth from the spine between the sixth and seventh ribs with my first case twelve years ago on my own responsibility and I have had no reason to change.

Matas and Godlee lay down the rule that, in the absence of bulging and pointing prominently, the opening should be as high as the centre of the effusion, which is usually about the sixth rib, otherwise the retraction of the diaphragm being more rapid than that of the lungs is likely to close the opening.

Avoid wounding the inter-costal artery by making the opening in the centre of the inter-costal space or close to the upper border of the rib below. I did not consider resecting a rib necessary in any of my cases, but now I think had I resected a rib in my last it would have been better.

Having introduced the tube do not allow the fluid to escape too rapidly or syncope might result. Remove all flocculi or pseudo-membranes possible; wash out the cavity with warm water or sterilized water, boracic acid solution, weak solution of hydrogen peroxide, or weak solution of ac. carbolic.

Being satisfied that the cavity is thoroughly washed out, dress the end of the tube by a pad of iodoform gauze or bichloride gauze, or some such dressing, and a pad of absorbent cotton and bandage. Repeat the washing out and dressing daily until the discharge ceases, which usually lasts from two to four weeks.

Use a syphon or fountain syringe and keep the atmosphere warm and moist while dressing. Observe hygienic and dietetic treatment and give tonics and stimulants. Iron in some form is needed, for the drain on the corpuscular elements of the blood is very great, as is evident from the pale emaciated condition of the patient.

As a general thing, in three or four days the patient expresses himself as feeling very comfortable, the cough having almost ceased, the dyspnœa having disappeared, the pulse stronger, slower and more regular, the temperature normal or nearly so, appetite restored and general improvement in the patient's condition.

If a fistulous opening occurs it must be treated on general principles. It occurred in one of my cases. If an abscess forms in the muscles, as occurred in the same case of mine in which was the fistulous opening, a counter-opening in the most dependent part with free drainage, washing out the sac and firm pressure, will soon obliterate it.

A brief report of the cases that have come under my observation is as follows:

CASE I.—I read a report of this case before the Medico-Chirurgical Society of Ottawa (the society being in existence at that time), which was published in the *Canada Medical and Surgical Journal*, March, 1884.

History.—Mrs. J., aged 20, married two years; tubercular history; never had any serious illness till April, 1882, when she had a miscarriage six months after her marriage. February 17, 1883, she was delivered of a large, healthy boy. Fifteen days after confinement I was sent for in great haste; this was my first visit. I found her with chills, headache, thirst, temperature $104\frac{3}{5}^{\circ}$, pulse 140,

tongue dry and coated and violent delirium. Septicæmia had occurred. Washed her out with 1-40 carbolic acid, introduced iodoform capsules, put her on internal treatment, gave explicit orders to the nurse; gave an unfavourable prognosis and left.

March 6, visited her again and found her much better. Chest trouble was absent till 23rd, when I found all the symptoms of effusion into the left pleura, confirmed my diagnosis by hypodermic needle. Aspirated on the 25th and drew off a large quantity of putrid matter. April 3rd aspirated again and drew off about the same in quantity and character. April 18th aspirated again with same results. Temperature was 105 at this time and a fistulous opening had formed into the bronchi.

July 14th I gave an anæsthetic, operated and introduced a silver drainage tube. She gained steadily and September 9th I removed the tube and September 18th the wound was healed. Perfect recovery. Has had five children since.

Her sickness would no doubt have been weeks instead of months had I operated when I first found purulent matter.

CASE II.—G. A., aged about six years. Tubercular history in father's family. Had pneumonia of right lung in April, 1884, which continued about three weeks, when empyæma developed. Very little increase in temperature during day, but an evening exacerbation to 102°–103°. Had night sweats, anorexia, difficult breathing, etc., and became greatly emaciated.

I aspirated and opalescent matter was withdrawn in large quantity. I waited a few days and the cavity refilling I operated.

In fourteen days I removed the silver drainage tube, a week later the wound was healed and he made a perfect recovery, with not much retraction of the side; is a strong, healthy young man to-day.

CASE III.—November, 1885, was called to see J. M.,

aged 11 years. Had been sick for about two months; was given up to die with phthisis.

I diagnosed empyæma. Had a good family history. I aspirated left side and removed a large quantity of creamy matter. It began to refill in a few days and I operated as in the others. Removed a good deal of pseudo-membranes and flocculi. Removed tube ten days after and a few days later the wound was healed. Perfect recovery.

CASE IV.—E. A., about 24 years. Had been attending him for some time for phthisis, and in December, 1885, I aspirated both sides for empyæma and removed a large quantity of creamy pus from both pleuræ. The patient was so far gone with phthisis that I refused to operate, but yielded later, and on December 29th I introduced a silver drainage tube into the left side. The patient died in a few days.

CASE V.—Annie H., aged three and a half years. Mother and sister died of phthisis. About February, 1885, had pneumonia and in March empyæma set in. I aspirated and in a few days operated and removed, with the greenish pus, an immense quantity of pseudo-membrane. I never saw as much in any two cases before or since.

Removed tube in three weeks and wound healed in one week later. Perfect recovery and healthy ever since. Since then her father died of phthisis.

CASE VI.—H. B., aged four years. Family history good. In August, 1886, had pleurisy with effusion, but was not absorbed, and empyæma developed from the suppuration of the exudate. I aspirated and a few days later operated. Tube remained in eighteen days. Wound healed a few days later and was a perfect recovery.

CASE VII.—Mrs. H. J., about 38 years, married and had five children. When I first saw her I diagnosed empyæma and operated March 1st, 1892. Removed tube 20th March. About three weeks later wound was closed. Was a good deal of retraction of side. Did her own work around a farm-house. Took measles six or eight weeks later and died of meningitis.

CASE VIII.—Miss C., about 36 years, sick for a long time with pleurisy. Came to Ottawa and I saw her February 9th, 1893. I aspirated and removed a large quantity of opalescent matter. The fluid very slowly accumulated, but was expectorating the same kind of matter. In about ten days I again aspirated, but got a good deal less. In about six or eight weeks the fluid had all disappeared. She was very slow in convalescing. This case I look on as an example of what Osler describes as "cure by local necrosis of the pulmonary pleura, exposure of the parenchyma and a soakage of the pus through the spongy lung tissue into the bronchi."

CASE IX.—F. Mc,, aged about six years, was brought to me in June, 1894. Had been sick a long time; was coughing and vomiting opalescent matter daily. Bronchial fistula had formed. Put him on tonics and stimulants. Recovery tedious but successful.

CASE X.—B. W., aged about four years. Had scarlet fever in Prescott last spring. Saw him during the desquamation stage. Had gangrenous sore throat. When convalescing returned to Prescott. In about three weeks returned and had empyæma. Operated June 16th, 1894. Removed tube about four weeks later. Abscess of muscles of back formed. Made counter-opening and drained and washed thoroughly and sac was soon obliterated. Necrosis of the ribs in contact with the tube occurred. Removed the necrosed surfaces.

A fistulous opening still remains, but I heard lately he was doing well. He has been gaining rapidly since tube was introduced. Drs. Klock and Jamieson rendered me valuable assistance in this case.

He was the most difficult patient to manage I ever had. His ribs were very close together, and I think it would have been better to have excised a portion of one rib before introducing the tube in this case. Had I anticipated necrosis I certainly would have done so.

N.B.—I swabbed out the fistulous opening with tincture of iodine and since then the fistula has disappeared and he has made a perfect recovery

NOTE ON A NEW ETHER INHALER.

By James Bell, M.D.

This inhaler consists of an aluminium cone of suitable size, made without seam or roughness, covered with stockinette, within which, on the inner surface of the cone, is placed some gauze or absorbent cotton. The advantages claimed for it are, first, that it is perfectly clean and may be sterilized as a whole by dry heat The gauze and stockinette covering are renewed for each patient. The aluminium is of course not absorbent and is malleable, so that the edges may be moulded to fit any peculiar conformation of face. It possesses the advantages of a clean folded napkin which can be sterilized before using, and which is the simplest form of inhaler, with the additional advantages of having sufficient consistence to maintain its form and shape.

We are apt to forget that ether is not a supporter of respiration, and that while we add ether vapour to atmospheric air it is of the utmost importance that we should provide for the entrance of pure air into the respiratory organs during anæsthesia. The Clover inhaler which is now so much in vogue possesses all the disadvantages which it is possible for an ether inhaler to possess. It has but one redeeming feature,—that is, it economizes ether,—a small matter when we consider the welfare of the patient. It is impossible to cleanse it. Patients go on, one after another, respiring through the same filthy mask and the same rubber bag, each one adding his quota of mouth secretions, perhaps syphilitic, cancerous or tubercular. Tubercle baccilli must frequently be deposited upon its walls and vomited matter saturates it from time to time, not to speak of the absolute impossibility of sterilizing the mouthpiece to correspond with the precautions which we take with all the other substances coming into close contact

with the field of operation. In operations upon the face, head and neck this is of vital importance. I have had many years of experience with the Clover inhaler and I am convinced that even in the most careful hands it is a dangerous instrument; needless to say it is much more so in the hands of the careless or inexperienced. It is an asphyxiating machine, and only in proportion as it asphyxiates does it economize ether. (If used without the rubber bag it possesses no advantage over the ordinary cone.) The patient respires the same air over and over again from a rubber bag, the respired air passing through a chamber containing ether in the liquid form. It is only as the ether becomes vaporized that it enters the system through the pulmonary mucous membrane and produces its effects on the nerve centres. Should the rubber bag be kept applied anæsthesia is more rapidly produced, because in addition to ether anæsthesia there is asphyxiation by carbon dioxide. The answer is made, however, by adherents of the Clover inhaler, that the patient should be allowed a breath of fresh air at every third or fourth inspiration. I reply that he should have pure fresh air at every inspiration, and if he does not it is only a question of degree of asphyxiation. I have had, as already stated, a long experience with the Clover inhaler; I have had, I am sure, very serious after results from its use. I am quite certain that in many of the cases in which the patient becomes livid, and in which the bronchial tubes become filled with frothy mucous, these results are attributable to the inspiration of impure air. These patients generally vomit after operation and are very slow to recover consciousness. Where ether anæsthesia has been produced without asphyxiation, even when maintained for a couple of hours, consciousness is rapidly regained after the administration of ether has been discontinued. The Allison inhaler and others of similar construction cannot be charged with producing asphyxia; they are simply unclean and from their construction it is impossible to sterilize them. I maintain that ether properly administered is an absolutely safe anæsthetic. Proper ad-

ministration consists in adding to pure air the greatest possible amount of ether vapour. It must never be forgotten that pure air must be inspired constantly, and that ether vapour is not a supporter of life, and also that it should, as a rule, be given in as concentrated a form as possible. Ether dashed into a cone vapourizes much more quickly than when held in a metallic receptacle. It is true that ether vapour used in this way will be diffused beyond the patient and that a large quantity of it will be wasted. This is unavoidable, and except for the item of expense it does no harm. Although ether vapour is inflammable it is only so in a very concentrated condition, and it is impossible to saturate the air of a room sufficiently to ignite it with an open light. The only danger of ignition is in the immediate neighbourhood of the inhaler.

It seems strange that with the knowledge of bacteria which has been accumulating for years and our very strict precautions, based upon this knowledge, to avoid wound infection in surgical operations, that there has not long ago been devised some means to provide an asceptic inhaler, and one which could be cleansed of the secretions and exhalations of one patient before applying it to the face of another. It is simply horrible to contemplate the use of a Clover inhaler and bag which has already been used on the face of hundreds of other patients and without any possibility of properly cleansing it, either by heat or chemical sterilization.

Retrospect Department.

QUARTERLY REPORT ON DISEASES OF CHILDREN.

By A. D. Blackader, M.D.

Professor of Pharmacology and Therapeutics, and Lecturer on Diseases of Children. McGill University.

Typhoid Fever in Children and Infants—(*N. Y. Medical Record*, March 16, 1895). By Dr. L. Stowell.—In this paper, which he designates as a clinical study of the disease as met with in young children and infants, the writer gives us a comparative study of thirty-four cases met with during the past ten years in his hospital practice, and which were diagnosed by him as typhoid fever. Tympanites was nearly always present to a slight degree, and also gurgling at the ileo-cæcal valve. Diarrhœa was present in 29.5 per cent. of the cases. A few were constipated, though loose stools usually occurred a few times before recovery. The stools in some cases are said to have answered to the "pea soup" description. Hæmorrhage of the bowel did not occur in any of his cases. In 20 (66 per cent.) rose spots appeared, usually on the eighth day; in two cases they were profuse. Most of his cases occurred during the autumn months. In duration, his shortest case lasted 10 days, the longest 52 days; in three cases there were relapses. In age the two youngest were twelve months and seventeen months respectively. Epistaxis occurred in seven cases. The temperature ran high continuously in one case; in others it was more irregular. Pneumonia occurred in three cases. Bronchitis was common.

Although enteric fever in childhood is lightly spoken of, there are many autopsies reported. Whittaker says one should be slow in childhood to accept the diagnosis of typhoid fever. Most of such cases are typhoid conditions of pneumonia, tuberculosis, etc. And Meigs and Pepper

say that the mildness of the disease in childhood may be due to the glands of Peyer being less fully developed than in the adult. Nevertheless we have undoubted cases of death occurring from this disease, even in the earliest days of life. Bednar records a case of an infant five days old presenting typhoid symptoms and dying on the seventeenth day. Ernst reports an infant born of a mother suffering from enteric fever. The child died on the fourth day. The spleen was enlarged, and the blood of the heart showed typhoid bacilli. Eberth has also demonstrated typical bacilli in the organs of four fœtuses aborted by mothers having typhoid fever. In the Montclair epidemic of 1894, due to infected milk, eight infants developed the fever. Dr. Stowell draws the following conclusions from a *resumé* of all reported cases: (1.) The disease is common in childhood and not more rare in infancy than is explained by lack of exposure. (2.) The types and varieties do not differ materially from those of adults. (3.) The duration is shorter because the tendencies in childhood favour growth and repair more than in the adult. (4.) The prognosis is better in children, but in early infancy it is high.

In the discussion which ensued, Dr. Northrup asserted that from his experience as Pathologist to the New York Foundling Asylum, where he had more than 2,000 autopsies on children, he considered that typhoid fever was not a disease affecting infants under two years of age. The diagnosis of typhoid fever must rest on the same points as in the adult, but spleenic enlargement could only be diagnosticated in the infants, when the spleen could be felt below the free border of the ribs, and enlarged mesenteric nodes, swollen Peyer's plaques and solitary follicles, with enlargement of the spleen, were not infrequently met with in autopses on infants whose clinical history would exclude typhoid.

On Cardiac Irregularity in Childhood.—(*Zeitschrift für Klinische Medicin*, December, 1894; *The Practitioner*, February, 1895.)—In a very interesting paper, Professor

Heubner discusses the importance of this symptom. Some authorities, he says, maintain that it is never met with except in tubercular meningitis; others consider it as a mistake to regard it as an indication of either brain or heart disease, while a recent writer expresses the opinion that the pulse is more often irregular in children than in adults, and that, without influence from disease. In dealing with the subject, Heubner excludes from his consideration at first, those cases where the phenomenon is due to tubercular meningitis and pronounced cardiac inflammatory infection. The remaining cases he classifies as follows: 1. The simplest and most obvious are those where irregularity is met with after poisoning. Instances are recorded as occurring during convalescence after large doses of stramonium, digitalis, and opium. 2. Closely allied are cases of disturbed rhythm from digestive troubles. Arythmia is not an uncommon occurrence in the dyspepsia of children, and is probably due to a form of auto-intoxication. Heubner mentions, as an example, the case of a child, six years old, suffering from gastric disorder. Cerebral symptoms arose, vomiting, irregular intermitting pulse, retraction of the head, drowsiness and pyrexia. It was regarded as a case of auto-intoxication, and the diagnosis was confirmed by the favourable issue, and the appearance of acetone in large amount in the urine. In another case a slow unequal heart-beat appeared under similar conditions. 3. Cardiac irregularity may be met with in abdominal affections, where no grounds exist for regarding it as due to poisoning. A case of appendicitis is mentioned in a girl of eight years, in whom decided intermittency of pulse was present. 4. Arythmia may be observed in the course of the infectious diseases; (1) during the development and height of the disease; (2 during convalesconce. The first form is comparatively rare; the second form is more frequently met with, especially after diphtheria; it is also occasionally noted after scarlet fever, measles, and croupous pneumonia, and a case is recorded where the symptoms set in late after typhoid fever. 5. The occurrence of irregu-

larity in the pulse has been observed in anæmic, nervous and excitable children. It may be noticed also in weakly rachitic children, and may give rise to the diagnosis of meningitis. Arythmia and palpitation have also been observed in thin rapidly-growing children during the school period. 6. Intestinal parasites are said to cause cardiac irregularity, but the writer has had no experience of it. 7. It may occur under certain physiological conditions. Emotional states may produce it; it has been observed during sleep; and it occasionally follows a warm bath. 8. Da Costa describes an idiopathic form in which the children appeared otherwise quite well. Heubner in discussing the mode of occurrence of arythmia under these various conditions, refers many of the cases to an irritation of the cardiac centre. This is the explanation in tuberculous meningitis where increased pressure on the cranial vault affects the centres in the medulla. Where the irregular action is due to poison, we must assume a specific action either on the nerve centres or upon the heart muscle. The cause of its presence in rapidly-growing anæmic children is uncertain, but the suggestion that it may be due to a relatively small arterial system is founded upon experimental evidence. The appearance of irregularity in chronic cardiac disease has been observed by Heubner only in the stage of insufficiency. The treatment of cardiac irregularity in childhood demands a very careful consideration of the possible etiology, which must be combated.

On Cardiac Asthenia in Children Suffering from Infectious Diseases.—(*Le Progrès Médical*, December 22, 1894; *The Practitioner*, February, 1895.) By Dr. Sevestre.—The author remarks that infectious diseases of the adynamic type are much less frequent in children than in adults, and that in typhoid especially it is not uncommon to see the disease run its course in the child, without presenting the asthenic symptoms which characterize it later in life. Nevertheless, even when there are not the usual signs of adynamia, cardiac asthenia frequently occurs. It may supervene

rapidly and unexpectedly, but in general, symptoms of cardiac weakness may be foreseen. In the most severe form, cardiac asthenia may appear as a suddenly fatal syncope; generally, however, the attack after having lasted a few seconds disappears, leaving the patient weak and collapsed; the pulse rapid, irregular and compressible; the heart's action hurried and tumultuous and the impulse almost imperceptible. On auscultation the sounds are feeble and dull, the two sounds being almost indistinguishable, either by their tone, or by the unequal duration of the long and short silence. Sometimes this condition ends in death; more frequently the symptoms subside; but even though consciousness completely returns, the pulse remains shabby, and the heart sounds indistinct. In a milder degree, cardiac asthenia shows itself in cold extremities, slight cyanosis, and modification of the heart sounds and the pulse. Such symptoms deter him from employing the cold bath in infantile typhoid. While observation of the temperature may be important, frequent examination of the heart is not less so, both from the diagnostic and therapeutic point of view, The mechanism of heart failure is not simple. Alteration of the cardiac muscle plays an important *rôle*, but diminished arterial tension is another important factor, and it is only by keeping these two points in view, that a rational and effectual treatment can be instituted. As a tonic for the heart the author strongly recommends caffeine; and to increase arterial tension in some cases the use of normal saline solutions administered subcutaneously.

On the Nature of Gastro-Enteritis in Infants.—(*The Lancet*, February 16, 1895).—In a short editorial, attention is called to the result of examination of the blood of infants suffering from gastro-enteritis, conducted in Prof. Epstein's clinic in Prague. It is stated that in fifteen cases of gastro-enteritis, in which the blood was examined during life, the presence of micro-organisms was definitely ascertained in twelve. Staphylococci, streptococci, bacteria coli commune,

bacilli pyocyanei, and bacteria lactis aerogenes, all of which are known to occur in the intestinal contents, are mentioned as having been found in the blood of such infants, while in only two out of thirty apparently healthy children were any cultures obtained, and of eleven dyspeptic infants only one yielded any results. It is pointed out that this fact may explain the inefficacy of our therapeutics in some cases, while the variety of the organisms found may account for the multifarious character of the symptoms in this disease.

On the Early Diagnosis and Treatment of Whooping Cough.—(*Journal des Practiciens*, January 14, 1895).—In this article by M. Vignol, the symptoms by which an early diagnosis may be arrived at are discussed. The attack of stridulous laryngitis which sometimes appears at the beginning is comparatively rare, and seems to be peculiar to the patient rather than to the disease. Grinding of the teeth and sneezing are symptoms which may occasionally have a signification. Redness of the conjunctiva may be early noticed in catarrhal cases, and may exceptionally be associated with photophobia. The only true guide, however, to a diagnosis lies in the characteristics of the cough itself, which are somewhat subtle but rarely absent. After a catarrhal period of two or three days' duration, a peculiar cough sets in, which is not convulsive, but in which the nervous element can be detected. It is more frequent at night, sometimes exclusively nocturnal. There are no physical signs at this time in the lungs, and there is no expectoration. This lasts two or three weeks, during which its nervous character becomes more pronounced, and finally the distinctive cough sets in. It is very advantageous, if possible, to recognize the disease in the early period of its invasion and isolate the patient. Antispasmodics, the writer thinks, still form the basis of our treatment. Of them, he prefers belladonna and bromide of potassium. In addition, he recommends the diffusion of some antiseptic through the air of the apartment. Among

other methods of securing this, he recommends the placing of a ball of camphorated naphthalene under the child's pillow.

On the Use of Salophen in Children's Diseases.—Drews, of Hamburg, (*Allgemeine Medicinische Central Zeitschrift*, November, 1894,) recommends the use of salicylic acid and its salts, claiming for it a milder action and less liability to the production of unpleasant effects such as nausea, tinnitus, and collapse. It is also more readily taken. In fifteen cases of acute rhumatism in children, varying from 7 to 14 years of age, he gave it in doses of from three to five grammes per diem with good results. In three or four days pain and fever had subsided. It proved of great service also in acute muscular rheumatism of the neck muscles, and in a case of chorea in a girl of 13 years in whom a slight cardiac murmur was present. From his experience with it, Drews concludes that salophen may, with much confidence, be used in the rheumatic diseases of children, and will form also a useful antipyretic and anti-neuralgic.

On the Employment of Naphthalin in the Treatment of Oxyurides in Children.—Jahrbuch für Kinder Leithunde, Vol. xxxix., Nos. 2-3, *Therapeutische Wochenschrift*, February 17, 1895.) By Aurel Schmitz, M.D.—As naphthalin is a powerful antiseptic and germicide, and undergoes almost no change in passing through the bowel, Professor Ungar, of Bonn, more than a year ago, advised its use as a remedy in this very troublesome affection. The writer reports his experience with it in the treatment of forty-six cases suffering from oxyurides. His method of employing the drug is as follows :—After the bowels have been thoroughly cleansed by means of a mild purgative a dose (two grains for a child of one and a half years up to six grains for a child of 12 years) is given midway between meal hours, mixed either in a little sugar or in a capsule. This is repeated twice daily till four doses have been taken. Then a pause of eight days is made and, if necessary, the

course is repeated. A third course may be given after an interval of fourteen days. It is very important that during the administration of the drug, fat as far as possible should be withdrawn from the dietary, as its presence favours the absorption of the drug. If there be constipation, mild purgatives should be given after each course. With these precautions, he says, the drug is well borne. In twenty-six of the forty-six cases treated one course proved sufficient. The writer thinks that, given in this way, naphthalin is less dangerous than santonin.

Papain as a Remedy for Tænia.—(*The Medical News*, October 6, 1894.—In a letter Dr. Bartholow, of Philadelphia, mentions the successful use of papain in a case of *tænia solium*. The remedies most successful in the expulsion of this parasite are so nausoeus, and to young children often dangerous, that any drug free from these objectionable features should have a trial. In the case related by Dr. Bartholow, after the unfortunate host (an adult) had tried successively the various remedies ordinarily employed, and met only with disappointment, he was placed temporarily on papain, taking ten grains three times a day after meals. After a few days, segments in considerable numbers were passed. A terebinthinate preparation was then given, which had previously quite failed, and was followed by a dose of castor oil. Vomiting apparently was the only result, but within twenty-four hours an immense *tænia solium* was passed complete, coiled up upon itself and motionless. Dr. Bartholow thinks it possible that the papain exerted a toxic influence on the parasite.

Reviews and Notices of Books.

Twentieth Century Practice. An International Encyclopedia of Modern Medical Science. By Leading Authorities of Europe and America. Edited by THOMAS L. STEDMAN, M.D., New York City. In Twenty Volumes. Volume 1., Diseases of the Uropoietic System. New York: William Wood and Company. 1895.

This is the first volume of what promises to be one of the most complete and elaborate works ever published on general medicine. The list of contributors contains many of the leading authors and investigators on both sides of the Atlantic. In the present volume the diseases of the kidneys (both medical and surgical), prostate, male urethra, female bladder and urethra, and of the urine itself are dealt with.

Dr. Delafield is the author of the article on the disease of the kidneys. It is a painstaking contribution. Pathologically Delafield's classification of Bright's disease into numerous groups may be right; clinically however, it will prove, we believe, to be of no advantage, rather a disadvantage to the general practitioner. With this exception the article is, however, a very valuable one. Reginald Harrison, of London, writes on the surgical diseases of the kidneys and ureters, and on diseases of the bladder. Upwards of two hundred pages are devoted to these subjects. It is scarcely necessary to add that the distinguished author has presented his subjects in a very full and complete manner. We know of no more valuable contribution to these subjects in the English language.

Dr. G. F. Lydston, of Chicago, describes diseases of the prostate and male urethra. Hurry Fenwick writes on the diseases of the urine, including under this name hæmaturia, pyuria, accidental albuminuria, cystinuria, phosphaturia, oxaluria, polyuria and chyluria. Diseases of the female bladder and urethra are dealt with by Howard A. Kelly, of Baltimore. This is a very original and complete account of these diseases.

The volume on the whole is made up of what may be called

monographs on the various subjects. The endeavour to present the last and most complete knowledge has been, as far as we are able to judge, very successful. The illustrations are numerous and good.

The volume certainly reflects credit on all concerned—writers, editor and publishers.

Enlargement of the Prostate, Its Treatment and Radical Cure. By C. W. MANSELL MOULLIN, M.A., M.D., Oxon., F.R.C.S.; Surgeon to and Lecturer on Physiology at the London Hospital; late Radcliffe's Travelling Fellow and Fellow of Pembroke College, Oxford, and Hunterian Professor at the Royal College of Surgeons. London: H. K. Lewis, 136 Gower street, W.C. 1894.

This is the most complete and up to date monograph on the anatomy, pathology and treatment of enlarged prostate that exists at present. The author has taken up each part of the subject and dealt with it in a clear, practical and thorough manner. While it cannot be said to contain much that is new, yet the whole subject is here presented to the reader in a complete and attractive form. The subject is such an important one to every general practitioner, as well as the general surgeon, that it should be in the library of all physicians and surgeons.

Mr. Moullin is probably quite right when he favours early diagnosis and the surgical treatment by removal of the offending portion, in selected cases, before the so frequently occurring secondary changes in the ureters, kidneys and heart have become sufficiently far advanced that any operative measures must be undertaken as a *dernier ressort*.

We hope that the book will be well received and carefully studied.

Dose Book and Manual for Prescription Writing. By E. Q. THORNTON, M.D., Ph. G., Demonstrator of Therapeutics, Jefferson Medical College of Philadelphia. Saunder's New Aid Series. Philadelphia. 1895.

In this manual we have an excellent instructor in the knowlege necessary to write prescriptions correctly. Consideration is first given to the various weights and measures recognized by the Pharmacopœia, and the details of the metric system are

fully explained and compared with the apothecaries' weights. The details of prescription writing are then described, and the difficulties of the Latin Grammar are made easy for those who are unfamiliar with it. The principles which should underlie the combination of drugs, the several forms of incompatibility, dosage, and the various methods in which drugs may be administered are fully explained and illustrated, and a table of solubilities is given. The last chapter contains a list of all the official drugs and preparations, with the minimum and maximum dose as generally prescribed. We can imagine such a book to be of much assistance to students and junior practitioners, and to such we cordially recommend it. The price is extremely moderate. A.D.B.

Statistique et Observations de Chirurgie Hospitaliere. Par Dr. POLAILLON, Chirurgien l'Hotel Dieu; Professeur Agrégé à la Faculté de Médecine de Paris; Membre de l'Académie de Médecine. Paris: Librairie Octave Doin Éditeur, 8 Place de L'Odéon.

In this volume is collected and presented to the reader the large surgical experience of the author during fourteen years in one of the largest clinical fields in Paris. The statistics are regional and give much valuable information concerning the class of cases found in a large city hospital. The results of treatment with and without operation are clearly and concisely stated. It is worthy of perusal, and valuable information may be obtained from its careful perusal.

Surgical Asepsis. By CARL BECK, M.D., Surgeon to St. Mark's Hospital and to the New York German Poliklinik, etc. Pp. 306. Philadelphia: W. B. Saunders. 1895. Price, cloth, $1.25.

This manual is thoroughly practical, giving the theory and principles of aseptic as opposed to antiseptic surgery. The technique described is that which should be carried out, not only in the well-equipped modern operating-room, but in the patient's private residence. The practitioner who undertakes the most minor operation, and the student entering on his career will read this little volume with profit, for in it he will find described everything that is necessary for the treatment of wounds at the present day. The illustrations are excellent, the type is large and the style is easy.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

Stated Meeting, February 22nd, 1895.

G. P. GIRDWOOD, M.D., PRESIDENT, IN THE CHAIR.

Discussion on Hypertrophy of the Heart Apart from Valvular Disease.

Dr. JAMES STEWART introduced the subject by a paper on the etiology. (See April number of this JOURNAL.)

Dr. ADAMI discussed the anatomy and experimental pathology. (See page 811.)

Dr. F. W. CAMPBELL described the treatment, which will be published next month.

Dr. MCCONNELL thought the point insisted upon by Dr. Adami, that all the changes occurring in cardiac hypertrophy were the result of increased tension, was the essential one to keep in mind in considering its pathology. There were a great many causes which might bring about increased tension. Dr. Stewart mentioned many, probably most, but had not, he thought, laid sufficient stress upon the effect of poisonous substances circulating in the blood—the result of improper oxidation, or even of bacterial growth, especially in the gastro-intestinal canal, producing auto-intoxication. These often were the most important factors in giving rise to increased tension. Arterio-sclerosis and cardiac hypertrophy, as for instance in Bright's disease, especially that form known as "contracted kidney," were essential. Anæmia and chlorosis, Dr. McConnell thought, were also often accompanied by hypertrophy and dilatation where there was increased tension. They had a tendency to produce increased resistance in the peripheral blood vessels, causing hypertrophy and dilatation of the heart, the latter owing to the lessened nutritive qualities of its blood supply. Many of these

cases seem to depend on deficient action in the gastro-intestinal tract with auto-intoxication, and the increased tension may depend on changes in the capillaries and arterioles owing to the glandular functions of these endothelial cells being exercised in eliminating morbid matter from the blood. In the condition called lithæmia, also, the products of deranged metabolism led to increased tension. It was almost impossible, he believed, to separate dilatation from hypertrophy, as they so often occurred together. Lung affections also, emphysematous conditions, even chronic bronchitis or sclerotic changes, as in fibroid phthisis, by giving the right heart more work to do, were apt to cause hypertrophy. Even obesity might act as an etiological factor, and phenomena of a purely neurotic origin often tend to bring about this condition. He had a case of tachycardia not long before in which the whole trouble seemed to be of a neurotic character, and it became almost chronic tachycardia. There was no organic trouble, but a certain amount of hypertrophy resulted, then imperfect compensation followed, succeeded by heart failure and death. Dr. McConnell thought that murmurs following relative incompetence might be mistaken for valvular disease.

Regarding the treatment, he believed it must vary as the cause varies. Sometimes he would lessen the action of the heart, sometimes increase it, but the most important feature of the treatment was likely to be the clearing of the blood stream of all poisonous or extraneous matters which might be the cause of increased tension by promoting the action of the chief emunctories and lessening the amount of fluid in the body. Baths play an important part in this latter respect. A recent writer who studied the action of baths at Nanheim, Germany, in valvular disease, known as Schott's disease, believed they diminished the size of the heart by peripheral dilatation of the vessels, besides increasing the sink transudation. Brine baths, carbonic acid baths, and hot baths were all employed for this effect.

The patient came out with a skin as red as a lobster, and the area of hypertrophy and dilatation as determined by percussion was sometimes reduced as much as one inch as the result of a single bath.

Dr. FINLEY thought too much stress might sometimes be laid upon arterial sclerosis as a causative factor in the production of cardiac hypertrophy; that it might sometimes be a secondary rather than a primary condition, although, with the sclerosis once established, a vicious cycle was set up, in which enlargement of the heart and sclerosis produced and kept up each other. He believed, however, that some cases occurred in which the cardiac trouble was the primary one. Cases of aortic regurgitation were not uncommon in young people where a considerable degree of arterial sclerosis existed. In Graves' disease Dr. Adami seemed to think that the enlargement of the heart was due to increased arterial tension; now, in these cases the arterial tension was low. It seemed to Dr. Finley that the cardiac changes that occurred in Graves disease might be the result of the increased work thrown on the heart by the increased number of pulsations. As to the symptoms of cardiac hypertrophy, one may say there were none. It was when dilatation supervened or when compensation was defective that symptoms occurred. They were, of course, similar to the symptoms following mitral disease when compensation was failing. All kinds of pulse were met with in this condition; sometimes weak and irregular like the advanced stage of mitral stenosis; sometimes in pairs, one weak and one strong; and the few cases of brachycardia and tachycardia seen by Dr. Finley were associated with this condition. He regretted that physiology had not been able to do more to clear up this subject; so far experimental work had thrown very little light on the irregularity of the pulse. Touching the treatment, he believed it a good rule to divide the cases into two classes, (1) those of high tension, (2) those of low tension. In the first the object should be to decrease tension, and iodide of

potassium was often very useful in relieving distressful attacks of palpitation; nitro-glycerine had its uses, and purgatives, especially mercurial, followed by a saline in the morning, were of very considerable value. For the purpose of relieving sleep and distressing dyspnœa, nothing equalled morphia. The other hypnotics, such as sulphonal, chloral, paraldehyde, often failed. In the second class attention should be directed towards strengthening the heart and giving the ordinary cardiac tonics.

Dr. LAFLEUR, seeing that Dr. Stewart had exhausted the etiology of the subject, would content himself with reading a tabular statement of cardiac hypertrophy in general. It was based as follows: (1) Causes within the heart: these were practically two; (a.) myocarditis, however induced, either sclerotic, or that which is the result of chronic pericardial inflammation; (b.) aneurisms, which by weakening one portion produced hypertrophy in others. (2.) The second great division included causes outside the heart; among these were noted; (a.) purely mechanical causes, and of these the principal and only one was in reality adhesion of the pericardium, synechia pericardii, which might or might not be combined with pleural adhesion; (b.) a great number of causes which depended upon the raising of blood pressure. Here the distinction might be made of blood pressure raised in territorial areas, or a general increase of blood pressure; among the former were chronic or subacute nephritis, chronic pulmonary diseases, chronic bronchitis, sclerosis of the lung, and true chronic fibroid phthisis. Still dealing with territorial raising of blood pressure, we had the pressure of tumours upon large vascular trunks (quite a rare cause, but it might occur in mediastinal disease). Then the general raising of blood pressure, as brought about by poisons of various kinds; by excessive manual labor; nervous derangements; and arterial sclerosis. (3.) Hæmic plethora. This was not infrequently combined with arterial hypoplasia. Dr. Lafleur remarked he had access to some statistics which showed the proportion in

which these various causes come into effect, drawn from 360 autopsies, representing the total number of autopsies from the opening of the Johns Hopkins Hospital, May, 1889, to April, 1893. In 360 autopsies, cardiac hypertrophy, due to some cause or another, was found to exist in no less than 105 cases. Of these arterial sclerosis was found to be the cause in 59%; chronic nephritis in 13.4%; valvular lesions, 12.4%; adhesions of the pericardium in 7.6%; excessive muscular work in 3.8%; tumours, 1.9%; aneurisms in 0.95%; hæmic plethora in 0.95%. It was seen from this paper that more than 50% of the cases of cardiac hypertrophy in general hospital work was due to arterial disease. The frequency therefore of arterial sclerosis had certainly been underestimated. The speaker knew it to be extremely common in the United States, and, from all reports, it was so upon the continent of Europe. He agreed with Dr. Adami that dilatation, in the vast majority of cases, accompanied hypertrophy. Concentric hypertrophy was almost always a post-mortem change. An observer (Corvisart) during the time of the "reign of terror" in France, records that persons guillotined were noticed in the post-mortem rooms to have firmer contracted hearts with small cavities; showing that the apparent thickening of the wall was due to strong rigor mortis. Dr. Lafleur wished to know if he had understood Dr. Adami rightly when he stated that in general arterial sclerosis the connective tissue change in the intima was the initial point? He, himself, had been accustomed to consider that the essential primary condition was a degeneration of the media, and that the connective tissue change was really a reparative process, such as was seen in all cases of sclerosis. This latter, at all events, was the view of Councilman and Thoma. The vicious circle, alluded to, was especially marked in those cases of arterial sclerosis accompanied with hypertrophy; why it should be particularly so in general arterial sclerosis was easily understood when we considered the enormous number of vessels involved. Not only the systemic, but the pulmonary circulation was

affected in these cases, and the disease of the later reacted on the right heart just as that of the former did on the left. The prognosis was especially bad in cardiac hypertrophy with dilatation when it occurred in cases of general arterial sclerosis. Dr. Lafleur remarked in connection with the treatment that he thought Dr. Campbell should have been justified in protesting when asked to discuss the treatment of cardiac hypertrophy, because after all hypertrophy was a conservative process, and therefore beneficial. Allusion was made to Oertel's treatment of hypertrophy. That treatment had not found the favour here that it had in the old country. Some very stringent remarks have been passed upon it. One writer declared that a large number of people who have not cardiac disease, will be cured by it and the few who followed it, and really have the disease, will be killed. The speaker wished to add his testimony in favor of local and general bleeding in cases of hypertrophy from arterial disease. That and hydragogue purgatives were the only means we had. He had seen one case where bleeding certainly saved the man's life. The man was completely comatose, and was rapidly approaching his end, when he had him bled to the extent of 18 ounces; he was at work upon his farm two months later.

Dr. BLACKADER, in considering the treatment of the various forms of cardiac hypertrophy, held that much importance must always be given to the etiology; without clear ideas on this point we would certainly fail to obtain all the relief for our patient which was practicable. In some cases temporary rest of the body in the recumbent position formed an important therapeutic measure. We secured for the heart a comparative rest, also, by limiting the amount of fluids taken into the stomach, and in this way lessening the amount absorbed, and the total volume of blood to be moved. In the diseases of no other organ would a due consideration of ordinary physical laws give so much assistance in treatment. In another series of cases disturbed innervation seemed to play an important role, either affecting the cardiac nerves and producing over-

action, or acting on the minute arterioles, producing an increase in arterial tension, and thus adding to the work of the heart. Such cases might receive much benefit from the careful use of nerve sedatives, such as the bromides, or chloral hydrate. Both these drugs, but especially the latter, had a direct action on the cardiac and vasomotor nerves, while at the same time they overcame the insomnia and general restlessness which in many cases were prominent features.

While recognizing fully the value of the various therapeutic measures mentioned by Dr. Campbell for the relief of the later stages of the disease, when we had to deal with a failing heart Dr. Blackader thought that attention had not been sufficiently called to the necessity of recognizing and treating the earliest condition in which there was a pure hypertrophy of the heart muscle. For treatment such cases might be grouped into two classes, (1) those in which the chief trouble, for the time being, lay in over-action of the heart muscle; (2) those in which the principal difficulty was undue contraction of the arterioles. And to meet these conditions we had two drugs which would, properly employed, give efficient assistance. The first was aconite, which acted directly on the heart, lessening its force and frequency, and had comparatively little action on the vascular system. The second was a solution of either sodium nitrite or nitro-glycerine. Both of these acted directly upon the small arterial vessels and had almost no action upon the heart, and by them arterial tension could be lessened. If good results were, however, to be obtained, it was necessary to secure a steady action of the drug, praying due regard to the time required in its elimination. Aconite was eliminated comparatively slowly, and in order to maintain an even action it should be administered about every six hours. With the nitrites it was different, they were eliminated rapidly, and to maintain their action in the vessels the dose should be repeated at least every three hours. The ordinary routine method of administering

them two or three times a day was very defective and in most cases proved useless.

Dr. WILKINS mentioned a case which occurred recently in his practice which tended to establish high arterial tension as the cause of cardiac hypertrophy. The woman had been under his care for the last three years. She first complained of difficulty of breathing on the slightest exertion. Examination showed the lungs normal, slight enlargement of the heart, with increased accentuation of the second aortic sound. This led him to examine the urine. He found there sometimes slight traces of albumen, at other times albumen was entirely absent, but the urine was always of low specific gravity. During the last few months she suffered intensely from agonizing paroxysms of shortness of breath. They would seize her in bed, the face become pallid, the limbs cold, yet notwithstanding this the pulse was one of high arterial tension. Examining the lungs during these paroxysms breathing sounds were at first normal, later on some few râles might be heard, but at no time sufficient to account for the dyspnœa. One naturally inquired what could be the cause of the dyspnœa. He thought it must be due to a spasmodic condition of the pulmonary vessels, and this spasm was an indication of the condition of the vessels throughout the rest of the body. The spasm must be the result of some poison circulating in the blood. Already medical men were discussing the nature of this poison. Bright when treating of kidney disease spoke of the enlargement of the heart which was present in many cases. Some few years later Dr. George Johnson, of King's College, wrote a very interesting article upon this condition of thickening of the coats of the vessels in kidney disease, and described it as one of hypertrophy of the muscular coat. He thought the hypertrophy was due to the thickening of the capillaries which supplied nourishment to the body. Then came the demonstrations of Brown-Sequard and Claude Bernard. Johnson afterwards recanted his opinion as to the hypertrophy being due to obstruction in the capillaries; he then thought it to

be due to a spasmodic condition of the muscles of the blood vessels, which contracted with a view to prevent impure blood from passing into the tissues. Now, this latter theory would account, Dr. Wilkins believed, for the conditions present in his patient. That there was a spasm there could be no doubt, but the cause of the spasm might be a question—whether it was a reflex or a contraction induced by the direct contact of an irritant upon the muscles of the vessels, was a subject still under dispute. Most authorities at the present day were inclined to believe that the blood itself acted directly upon the muscular substance of the coats of the arteries and in that way prevented the passage through of the blood containing poison. Gaskell wrote an article upon the influence of irritants upon the muscular substance of the vessels and the heart; and he said that it was not necessary for the nervous system to be connected with the muscles in order to produce rhythmical contraction of the coats. An apparent objecton to this theory was the fact that one would sometimes see spasms of the muscular coat producing epileptiform convulsions in one person and in another some different condition; and again, if these irritating materials were all the time circulating, why were not the spasms continual? That was explained by the fact that in the body are found poisons of directly antagonizing effects. A couple of years ago a murder trial had taken place in New York in which some expert demonstrated the presence of morphia salts in the blood or stomach, and Dr. Vaughan, of Ann Harbour, was able to prove in court that substances could be obtained from the body having the same action as that of morphia, and that it was impossible to distinguish between the reactions of some of these poisons derived from the body and those of morphia. Some recent observers mentioned that poisons of an irritating nature could be obtained from the urine, which poisons were capable of producing tonic seizures. They said even that morning urine would give poisons differing from those of the urine of the evening. Considering all this, it did not take much to make one believe the possibility of

poisons existing in the body which were able to produce a narcotic action at one time and at another time a spasmodic action, or at one time the coma of kidney disease and at another the spasms of such conditions as were under discussion. In the vegetable kingdom the poppy produced medicines which were narcotic, and also medicines which were tetanic in their effects. It therefore required but little stretch of the imagination to believe that the blood contained materials which at one time might produce tonic spasmodic effects and at another time the opposite condition. For treatment, he believed in cases of kidney trouble the great thing was to lower the tension. Many cases would be found in which all treatment failed to reduce the quantity of albumen in the urine until the arterial tension was lowered, and the moment that was effected the albumen diminished, the pulse improved and recovery supervened. On the other hand, in a case where the tension remained high (somewhat acute cases with large kidneys), even though the albumen diminished, the course was likely to be towards chronic Bright's disease.

Dr. MILLS said that Dr. Lafleur and Dr. Finley in their remarks had apparently assumed that the condition of the arteries in the lungs might be the same as in other parts of the body. A recent discovery in physiology was of prime importance to the subject under discussion, that is that the vessels of the lungs were innervated like the systemic arterioles. This discovery explained why the right heart was invariably found full and distended in asphyxia, while the left was empty and contracted. If contraction of the pulmonary arterioles was assumed, it was easily understood why these phenomena occurred. Dr. Mills thought that the present views held with regard to the nature of blood pressure were far too simple and would have to be modified in favour of some more complex theory. He thought blood pressure could no longer be regarded as the mean result of the cardiac impulse and peripheral resistance.

THE

Montreal Medical Journal.

VOL. XXIII. MAY, 1895. No. 11.

MEDICAL FACULTY OF McGILL UNIVERSITY.

The past session of this Faculty has been a most successful one, the number of students being larger than ever before, and the quality of the work done being in no wise inferior to that of previous sessions. The fear that the increased length of the course would deter intending students from taking it has proved a groundless one, for although the time of attendance has been increased from twenty-seven to thirty-six months, the freshmen class numbered over one hundred members, a proof of their appreciation of the efforts of the Faculty to provide a full and complete course of medical education and of their own anxiety to fit themselves for their life's work as thoroughly as possible.

The new buildings and laboratories, for which the College is indebted to the generosity of Mr. John Henry Molson, were in active use during the session and proved an inestimable advantage to the proper conduct of the work. The large class-rooms, the well provided laboratories, the private rooms for the professors, all add to the comfort and well-being of both teacher and student and consequently better work was done.

We publish an account of the annual convocation from which the details of the work of the session may be gathered.

SIXTY-SECOND CONVOCATION OF THE MEDICAL FACULTY OF McGILL UNIVERSITY.

The annual convocation for the conferring of degrees in medicine at McGill University was held on Thursday afternoon, April 4th, in the William Molson Hall. Sir Donald Smith, the Chancellor, presided, supported by the Acting Principal, Dr. Alex. Johnson, on his right and Sir William Dawson on his left. The platform was occupied by members of convocation, while the graduating class and their friends occupied the body of the hall.

The Rev. Dr. Clark Murray opened with prayer, and the Dean then read the report of the examinations, showing that the number of students enregistered in the Faculty during the past session had been 401, and of these 53 has passed the examinations and fulfilled the requirements to entitle them to the degree of M.D., C.M., from the University.

The Chancellor presented the medals and prizes to the winners, and then the graduating class were duly "capped" by Dr. Johnson, the oath being administered by Dr. Ruttan.

Dr. Adami, on behalf of the Faculty, addressed the graduating class. (See page 801.)

Dr. Hargrave delivered the valedictory as follows:

Mr. Chancellor, Members of Convocation, Ladies and Gentlemen, and Fellow Students.

Another session has just come to a close, and, in accordance with the time-honored custom, we, the members of the graduating class of '95, desire to address a few words of farewell to our professors, fellow students, and friends who have favored us with their presence this afternoon. And although, strictly speaking, this is about all that should find a place in a valedictory address, we trust we may not appear too radical, should we deviate from this somewhat limited field, in order to give expression to some ideas, that may be of interest to most of us, and which have originated mainly in our experience during four sessions of our college life.

Our career as medical students, has been associated with one of the most interesting epochs in the history of our University. We cannot therefore, in the few moments at our disposal, give expression to all that deserves mention. Many interesting events must be omitted entirely, whilst others may receive only a passing notice. And whilst an effort will be made to confine our remarks to subjects of general interest, we trust, that under the present circumstances, we may not be regarded as having committed an unpardonable breach of the laws of good taste, should we occasionally refer to matters that concern more particularly our own circle.

It was in the autumn of 1891, that we first assembled in one of the class-rooms of the medical building, to listen to the opening lecture of the session, and also to words of welcome from our respected Dean. There were in our number representatives from every province of the Dominion. At that time we numbered ninety-five ; to-day we number fifty-three. Our former occupations being so different from the new work we had undertaken, considerable time had to be spent before we could break away from old associations, and become thoroughly at home in our changed environment. Modes of thinking, which, perhaps to some extent, had become stereotyped through lack of proper stimulus, had to be overcome, in order to make way for the knowledge we were seeking. And now, if we were to ask ourselves, what was it that induced us to take up the study of medicine, the answer, in most cases, might be embodied in the two following statements—first, the wide and varied field of study, embraced in a medical curriculum; and secondly, the true dignity of the profession itself.

This is not the place to go into a detailed account of the rise and development of medical science, yet by briefly stating the condition of affairs in the early centuries, by giving two or three landmarks, we may be better able to appreciate the results of modern research.

From the state of society pictured by the early writers,

and the reference made to the "healing art," we would be led to infer that the science of medicine was not unknown to the people. No doubt the practice of the science in the early ages was largely in the hands of astrologers and influenced a good deal by religious superstition. For instance, on the pillars of the temples of Æsculapius there were recorded the cures of the maladies of which the votaries of the "god of healing" were supposed to have been suffering. But it is not till the time of Hippocrates that we come upon anything like a system of medicine. The knowledge of anatomy, physiology and morbid processes in this school was no doubt limited, but the records of individual cases and of epidemics of disease were valuable productions. The influence of this school can be traced to Alexandria. Later on the science was taught in Byzantium; and this brings us near the time when the Arabian school of medicine flourished and of which Avicenna was the chief representative.

Thus in the early centuries we find the development of medical science confined to a few important centres. Here and there we come upon individuals filled with a love for research, endeavouring to carry out their investigations amidst the greatest opposition. But they were as faint lights, striving to pierce the darkness. They were impeded in their efforts by the superstition of the age and no doubt were considered fortunate if they escaped the fury of the populace, or did not bring down upon them the displeasure of the church, and a reward similar to that meeted out to Vessalius, whose only sin was an unrestrained love for post-mortem investigation.

This slow development of science may be accounted for to a great extent by the slavish devotion shown to the scholastic philosophy of the age; but back of this lay the influence of the church. The alliance between the Vatican and the schools had been so intimate that those who threw off the dominion of the former could no longer continue to recognize the authority of the latter. The church was the

dispenser of knowledge, and generally she taught that which best served her own purpose. The tendency was to exalt philosophy, whilst the more *practical* branches of learning were neglected. The followers of Plato did not fail to speak disparagingly of almost every branch of science, inasmuch as the sciences tended to draw the mind away from the contemplation of higher things. Lord Macauley speaking of the philosophy of the earlier centuries says, "It could not condescend to the humble office of ministering to the comfort of human beings." The spirit of the age was opposed to anything practical or scientific, and therefore very few far-reaching results in the way of bettering society are traceable to this period.

With the revival of learning a new order is instituted. But as this expression indicates only one phase of the change, it is better to speak of it under the wider term Renaissance. This period, drawing the curtain over the last of the middle ages, marks the emergence from ecclesiastical and feudal despotism. It developed what was original in mediæval ideas and was the embryo of the modern world. It was about this time, too, that Bacon arose with his new philosophy. The watchwords of his system were "utility" and "progress." It was further developed by Lock, and his influence can be traced even into the social problems of Voltaire and Rousseau in connection with the French Revolution. And still later we come upon it in such men as Leibnitz and Priestly.

In this practical turn that had been given to learning in general it is only reasonable to expect some good result in the field of medicine.

In the 17th century Harvey made his great discovery, whilst the present century has been marked by still greater triumphs. As a matter of fact, any development that took place in the other sciences reacted in a beneficial way upon our own particular branch. Some of the most important discoveries in medicine are due to researches in other sciences, notably chemistry and bacteriology. Medicine

furnishes one of those marked instances in which the other sciences have lent their influence towards improving the condition of man. It is an instance in which almost all the sciences have met upon a common platform, each contributing its share towards the diagnosis and treatment of disease. And we cannot speak too highly of the promoters of these branches of learning and of those who have done so much to advance the glory of our profession.

In reflecting upon the part such branches as these of which we have been speaking take in the province of medicine, we cannot but admit that the subject is a broad and varied one. It is not only necessary for the practitioner to be acquainted with those subjects that belong to medicine proper, but he must also be familiar with other subjects bearing upon his own particular branch, if he is to treat his patients intelligently and successfully.

But we were also induced to enter upon the study of medicine because of the dignity of the profession. This remark might come with more grace from some other than ourselves, but to-day we claim a little indulgence. We estimate the dignity of the profession by the aim it has in view in lessening suffering. A science that has done so much for humanity, that has striven to bless and elevate man, must surely commend itself to us. One of our modern writers speaking on the recent progress of medical science pays a high tribute to the aim of the profession. "She has restored eyes to the blind and hearing to the deaf: she has lengthened life, she has minimized danger, she has controlled madness, she has trampled on disease."

Besides this grand work the science has accomplished, it has also indirectly exerted a wholesome influence over our *minds* whilst engaged in mastering its truths. The good we have acquired in this respect will depend very much upon the way we have approached our subject. If our aim has been merely the massing together of facts, without even any regard to the order in which they have been compiled and stored away, we have to a large extent

laboured in vain and spent our strength for naught. If a disease were in all cases characterized by the same symptoms, evidently our proper course would be the mastery of those symptoms. But inasmuch as diseases are often abnormal in their symptomatology, it is necessary to cultivate accurate observation, and by a process of deduction endavour to arrive at a rational diagnosis. If we have not used our advantages with this end in view we must acknowledge we have failed to recognize one of the most essential features in a medical education. We do not mean to belittle the acquisition of facts. They are necessary, and during the last month we have been made quite conscious of this. But the man who has laid fast hold upon general principles and learnt to apply them has acquired an education and discipline far superior to that obtained from the mere mastery of facts. We trust we have in this respect caught the spirit of the teaching that has been imparted to us.

Besides being a means of discipline, the study of medicine has had a wonderful influence upon us, in shaping our views of life generally. Being so different from any subject we had previously investigated, it has exerted a benign influence upon the other kinds of knowledge we had already acquired. The former tendency of our minds has been turned into new channels, and we believe the little world in which we had lived, has expanded its borders. The views of life we had held were perhaps, in some respects, a little stern, and inflexible. These have been toned down, under the humanizing influence of our study. In some cases the very foundations were at fault. And thus by a two-fold process—by removing the unsafe elements, and building in the breach—we trust we have succeeded in causing the different factors to blend more harmoniously. And now, if anxious souls should fear, that with the advance of medical science, there is to be a corresponding dissolution of the moral order among medical students, we can assure them, if our experience goes for anything, we

have found the tendency of medical study, elevating and ennobling. And, we do really believe it possible to follow the study and practice of medicine without becoming very extreme evolutionists, that it is possible to attend lectures on this subject without doing any great violence to our conscience, that it is possible to discuss medical subjects in our medical society without feeling any baneful influence, that it is possible even to attend medical dinners and still continue to be *upright*.

The advantages that McGill offers in the way of acquiring a practical knowledge of medicine are by no means insignificant. The recent addition to the medical building, opened during the month of January, with its class-rooms and laboratories, has increased the comfort of professors and students, and given better facilities for practical instruction. The increased hospital advantages too, have given us a better opportunity of becoming acquainted with the clinical part of our course. Our only regret is that we have not had more time to make use of these privileges. We realize that this has been the most important part of our work, and we therefore congratulate those students who may receive all the advantages arising from the lengthened course of study. It may be possible to speak eloquently of heart murmurs, râles, and crepitations, as obtained from text books, but the only true knowledge of these can be obtained from examination of the patient. We may fail to retain all that has been imparted unto us in the lectures, but " that which we have heard, which we have seen with our eyes, which we have looked upon, and our hands have handled," in the wards and clinics, are the facts which have made an impression upon us.

It would be an evidence of ingratitude, should we fail to speak more particularly of our sojourn in the hospitals during the last two sessions. The Royal Victoria Hospital, situated as it is at the base of the mountain, and towards which the unfortunate may look with hope, is an institution complete in every respect. We cannot describe it

better than in the words of Holy Writ, "it is perfect and entire, wanting nothing." Here we have been led into all the mysteries of nervous diseases; and have witnessed operations performed in a masterly way. We have also found that in virtue of the good hygienic conditions existing in and around this worthy institution, there is a marked tendency towards spontaneous cure. So much so, that the lame and halt are not often seen within its doors. As a consequence, a small museum has been constructed, in which splints, extension apparatus, and old operation tables are to be kept—souvenirs of former surgery, and silent monuments to the triumphs of sanitary science. The Directors have happened upon a most novel yet very practical way of *fencing of* infection or of inducing the "red line of demarcation." So that now they are enabled to say to any advancing septic inflammation, or spreading gangrene, and to a great many other things, too numerous to mention, "thus far shalt thou come, and no farther." We wish the Royal Victoria Hospital every success.

It is late in the day to announce that the Montreal General Hospital is being entirely renovated; so we can only extend our congratulations on the thoroughness with which the work has been carried out. It was here we received our first clinical instruction. By a careful process of exclusion we were taught to diagnose the different forms of disease,—a method that has since often been the means of saving our reputation. Here, too, we have beheld the scalpel wielded by a *strong arm.* Yet we have seen that this fact is by no means incompatable with skill and dexterity. And the demonstrations being supplemented by lucid explanations, caused the seats in the "gods" to be as much in demand as those in the "dress circle." We feel certain that so long as this institution is presided over by such men as at present, the "Old General," as it is familiarly spoken of by former graduates, will continue to do a worthy work.

With such advantages as these McGill should give a

very practical course in medicine, and cannot surely lay herself open to the charge that John Ruskin makes regarding the current mode of teaching. "On the whole," he says, "and looking broadly at the way the speakers and teachers of the nation set about their business, there is an almost fathomless failure in the results. The main thing which we ought to teach our youth is to see something—all that the eyes which God has given them are capable of seeing. The sum of what we do teach them is to say something." By the use of the microscope we have been taught the normal condition of tissues, and also the changes in morbid conditions. We shall not readily forget the practical demonstrations in the anatomy room, nor the vivid illustrations drawn in red, and white, and blue, and yellow, and setting forth, as the case may be, the relations of the arch of the aorta or the distribution of the cervical plexus. In chemistry and physics we have been taught something of the forces of nature, both in the lecture theatre and in the laboratory. In organic chemistry we were told that, being in possession of one of the lower members of a series, we could with almost absolute certainty predict what the next higher substance should be. "There are theories and there are theories," but for once we realized we were in possession of one that might be operated. As a consequence, that which we had been accustomed to look upon as a heterogenous mass of facts, useful chiefly as a means of burdening the memory, soon became reduced to law and order, and the subject was looked upon as one of the most interesting in the curriculum.

But the time has come when we must say farewell and turn our faces towards a different phase of life.

We thank you friends and citizens of Montreal for the interest you have manifested in us this afternoon. We thank you for the courtesy you have on more than one occasion shown us, and for all your efforts to make our stay in your fair city a pleasant and prosperous one.

We are at a loss to find suitable words to address to you students with whom we have toiled. So we must ask you to let the friendship and goodwill which has previously existed between us, be a truer index to our feelings on this occasion than any words we can utter. We thank you for your co-operation in every movement pertaining to the good of the College and our mutual welfare. We shall watch your career with interest, and our wish is that all your efforts may meet with success. Some of you are now to step into the places we have vacated. We trust you may fill them more worthily than we. And now that the restraining hand has been withdrawn, and you left to your own council, we trust you may be delivered from all the dangers that beset your important office. Above all, we hope you will bear in mind and put in practice the good principles *we* have always endeavoured to impress upon you.

To you, our professors and teachers, we must also say farewell. As men you have impressed yourselves upon us. You have given us freely of your knowledge and your experience. When in unknown regions, and the fog very thick around us, we have found you reliable pilots. When we have sought your counsel, you have given it freely. You have always listened to any reasonable request we had to make; and not only by your words, but more by your actions, you have manifested a deep interest in our welfare. You have assisted in fostering in us a love for our profession, and the breadth that has characterized your teaching has done much to save us from narrowness or prejudice. We ask you to accept our sincere thanks for all you have done for us. For ourselves, we pass "among new men, strange faces, other minds," but the words you have spoken to us, and the associations of the last four years, will be treasured in our memories in years to come. This day marks an important event in our lives, looking as we do back into past and forward into the future. We do not mean to indulge in mere sentiment or pietism in making these statements. Our only wish is that our career

may never bring dishonour upon our profession or University.

The present event recalls a scene pictured in one of Tennyson's idylls, and which we cannot refrain from quoting. King Arthur is speaking of the manner in which he received his Knights into the Order of the Round Table:

> "I made them lay their hands in mine and swear
> To reverence the King, as if he were
> Their conscience, and their conscience as their King."

So, in being admitted to this Order this afternoon, our desire is to be made more conscious of the obligations we take upon ourselves. It is true we cannot by our efforts rid ourselves of the debt we owe to our University, but we are willing to devote our time and labour in promoting her glory. It may be an unworthy offering, but it is the best we can bestow; and if it be expression of honest hearts we feel it will not be lightly esteemed by you. Our parting hope is that our professional career may always be marked by a true sense of duty; for in this way we may best prove ourselves worthy sons of our Alma Mater.

Dr. Craik then summed up the work of the session as follows:

Sir Chancellor, Mr. Vice-Principal, Members of Convocation, Ladies and Gentlemen,

The interesting Ceremony which we have this day witnessed, by which fifty-three gentlemen have received their Degrees in Medicine and have been declared worthy to practice Medicine and Surgery in all their branches, marks the culmination of the Sixty-Second session in the history of this Faculty.

In its ordinary features this Convocation differs very little from those which have preceded it. We have brought before you a goodly array of worthy Graduates, in no sense inferior to those that have gone before them, and, we may fairly hope, even better equipped than they in the most modern ideas and methods, and you, Ladies and Gentlemen, and many warm friends who are not with us to-day,

have again helped and encouraged us by your countenance and assistance.

Of the 53 Graduates upon whom the degree of Doctor of Medicine and Master of Surgery has just been conferred, 21, or about 40 per cent., are from the Province of Ontario; 16, or about 30 per cent., from the Province of Quebec, and 16, also about 30 per cent., from other provinces and countries, including New Brunswick, Nova Scotia, Prince Edward Island, Manitoba, the West Indies and the United States.

The number of Graduates in successive years varies considerably from time to time, and bears no direct ratio to the number of Students in attendance during the same year. The number of Graduates this year is smaller by two than it was last year, and greater by seven than the year before; but calculated from a series of years the number is fairly proportionate to the average number of Students.

The area also from which our Graduates and Students are drawn is tolerably constant and is steadily widening in every direction, bearing a somewhat close relation to the total number of our Students. And this total number of our Students has been rapidly increasing, particularly during the later years. Twenty years ago the number was 129; ten years ago it had risen to 227; four years ago it was 261, and this year it is 401.

Of the 401 Students who have been in attendance this year, 155, or about 39 per cent., were from the Province of Quebec; 115, or about 29 per cent., from the Province of Ontario; 93, or about 23 per cent., from the Maritime Provinces and Newfoundland; 26, or about 6 per cent., from the United States, and 14, or about 3½ per cent., from the North-Western Provinces and Territories, the West Indies and Ireland.

It will thus be seen that about 61 per cent. of our Students and 70 per cent. of our Graduates have come from homes outside of the Province of Quebec, and at least an equal percentage of them will eventually establish them-

selves in practice outside of this Province. It is only necessary to state these facts to make it obvious, how great would be the misfortune of having our Curriculum or the scope and breadth of our teaching, narrowed and controlled by local and selfish cliques, or by antiquated and anti-academical Legislation.

We think we may fairly claim that to this breadth and progressiveness of our teaching and the earnestness with which it has been carried out, much of the success of our Faculty has been due. Progressive thoroughness has always been our aim, and in order to attain to it and to maintain it, we have not hesitated to adopt new methods,—even when we could ill afford the expense and the labour,—whenever their utility had been well established; nor have we hesitated, on the other hand, to cut off from our educational tree branches which had become obsolete and useless and which, if not removed, could only lead to decay and unfruitfulness, blighting, sooner or later, the very life of the tree itself.

In this world, and particularly in this age and in this country, stagnation in educational, as in business matters, will not long be tolerated. The public is quick to detect and quick also to condemn everything that is offered to it that is not the best and the freshest of its kind, and the Faculty or the Firm which offers to the public of to-day products fashioned after the models or methods of the last century, or even sometimes of the last decade, is apt to meet with neglect and failure. On the other hand, the Firm or the Faculty which strives to provide for the real wants of the public, and in forms suitable to its tastes, will not long have to complain of neglect or lack of appreciation.

I will not say that our Faculty has always lived up to this ideal, but it has always striven after it. We have made our mistakes and we have had our shortcomings, but when we have discovered them we have been prompt to remedy them, and we have never hesitated between a present loss and future failure.

But I would not have it thought that in thus referring to some of the sources of our success as a Faculty, I have even for a moment been forgetful of the magnificent gifts and endowments which we have received at the hands of our Chancellor, Sir Donald A. Smith, and our Senior Governor, Mr. John Henry Molson, and many other generous friends of the Faculty and of the University. The present enviable position of our Faculty is largely due to these ample and timely gifts, and the Faculty will never cease to be grateful for them; but I trust I may be forgiven if I venture to say that these gifts might never have been given, if the Faculty had not been doing its utmost to achieve success without them, and that our benefactors, like Providence, take delight in helping those that are striving earnestly to help themselves.

As a natural result of the generous benefactions which have been bestowed upon us, and also of the advanced ideas and methods of Medical Education which we have always striven to maintain, the present Session has been carried on under exceptionally favourable circumstances. The Students in attendance have increased since last year by no less a number than 51, or nearly 15 per cent.; the working capacity of our Buildings and our Laboratories has been nearly doubled, and the Royal Victoria Hospital, with its perfect equipment now in full operation, has more than doubled in extent and completeness our field for Clinical Instruction.

On the 8th of January last our new Buildings and Laboratories, erected from the ample fund contributed by Mr. John Henry Molson, were Officially Declared Open in an eloquent Address by His Excellency the Governor General, who was accompanied by Her Excellency the Countess of Aberdeen, and in the presence of a very distinguished company, composed of citizens of Montreal and other friends of the University from every part of Canada and from the United States. We had the pleasure also of listening to an able and learned Address from our dis-

tinguished Graduate and friend, Professor Osler, of Johns Hopkins University, Baltimore, and appropriate Addresses were also given by Sir William Dawson and the Acting Principal, Professor Johnson.

I shall not detain you by a detailed description of the new and commodious Buildings and Laboratories which were formally opened on that occasion, and which have been in active use throughout the session. Such a description will be found in our Annual Calendar, but I may say that they include a new Lecture Room that will seat comfortably more than 450 students, with adjoining Preparation Rooms and Commodious Laboratories for Physiology, Pathology, Histology, Pharmacology and Practical Hygiene. This increased accommodation in the New Buildings has enabled us greatly to improve the departments in the older buildings. The Chemical Laboratory and the Anatomical Rooms have been nearly doubled in extent; a suitable Faculty Room has been established, the Professors and Demonstrators have nearly all been provided with comfortable rooms, the Students' Reading Rooms have been greatly enlarged and improved, and increased space has been given for the enlargement and improvement of the Library and Museum.

But not only has the Faculty been overcrowded for many years, as to Space, but owing to the gradual expansion of its Curriculum, and the greater development of its practical methods of teaching, it has also gradually been becoming overcrowded as to Time; for it is no more possible to compress into four sessions of six months each, even with the addition of an extra three months summer session, work that would fully occupy the time of five or six sessions, than it would be to crowd our 400 students into a space only sufficient for a little more than two-thirds their number.

And yet that is the very thing that we have been trying to do for many years, and which most Medical Schools of the better class are still trying to do. The original

Medical Session only lasted from three to four and a half months in any one year, and our Faculty was among the first, if not the very first, on this continent to increase it to six months. This system, with its long vacations, was the outcome of the Apprentice system which was in vogue even as late as my own student days, and which gave our Preceptors and Masters the benefit of our private services during a large portion of every year; but since the old system of private instruction and apprenticeship has been superseded by public hospitals and clinical instruction, the long vacations have become useless to students and practitioners alike, and the necessity for their continuance has passed away.

It had been apparent to our Faculty for many years that four six-months sessions were insufficient for the work that was being crowded into them, and as long ago as 1870 an optional summer session of three months was established for the purpose of relieving the somewhat turgid winter session. A second summer session has been practically introduced for some years, but even this was found to be insufficient, and we found ourselves, therefore, face to face with the problem, of either adding another year to our course of study, imposing, of course, an additional burden upon the students and their parents and guardians, or of utilizing to the utmost the long vacations, imposing thereby some additional labour upon our teachers, but giving to the students the benefit of time which hitherto has been largely wasted. It was plain to us that the latter alternative was by far the best, and at the close of the last session, in 1894, with the immediate prospect of largely increased laboratory extension, and the additional clinical field to be covered, the time seemed opportune for giving effect to our ideas and wishes, and the time-honoured, but seemingly obsolete, Six-months session was abolished, and an annual session of Nine Calendar Months was established to take its place.

The advantages to be looked for from this change are

many and great. Besides those already mentioned, it has the great advantage of giving our students thirty-six months of Academical Instruction instead of twenty-four, or at most twenty-seven as formerly ; and when the great superiority of Systematic Academical Teaching in College and Hospital over the old vacation system of irregular private instruction, or, more often, no instruction at all, is taken into account, the advantage of the change in this respect must be obvious to all.

The change was made, not without some misgivings as to the effect upon the numbers of our students, and we were prepared to see diminished classes for a year or two; but, as in the case of most other movements that have been made for the advantage of the students, they were the first to appreciate it, and our numbers, instead of diminishing, have this year been much larger than ever.

The changes in the *personnel* of the Faculty during the year have only been such as were rendered necessary by our altered conditions. Professor Roddick asked to be relieved from the duties of the Chair of Clinical Surgery, retaining only the General Chair of Surgery. Associate Professor James Bell was made Professor of Clinical Surgery, and Dr. George Armstrong was made Assistant Professor in the same Department. Dr. F. G. Finley was made Assistant Professor of Medicine and Clinical Medicine, and Dr. Henry A. Lafleur became Assistant Professor of Medicine and Lecturer in Clinical Medicine. Dr. Wyatt Johnston was also made Lecturer in Bacteriology.

In addition to the foregoing, which were University appointments made by the Board of Governors, the Faculty also made some additions to the staff of Demonstrators and Assistant Demonstrators, raising their number to 13, making, with the Professors and Lecturers, a total Teaching Staff of 36 individuals.

I had the pleasure last year of reporting the gift to the Faculty of a portrait of Dr. Robertson, the original Founder of our School. This year we have had the pleasure of

adding to our Collection of Portraits that of the late Professor Archibald Hall, who, from 1835 to the time of his death in 1868, a period of 33 years, took a prominent part in the work of the Faculty, and contributed to its success in no small degree by his industry and talent, both as a Writer and Taeacher, and for many years in the responsible position of Registrar. The Portrait is the gift of his daughter, Mrs. Rebecca Jones, to whom the Faculty takes this opportunity of acknowledging its obligation.

Did time permit, and were this a fitting occasion, there are other matters connected with our Faculty and its work, which might well claim our attention, but I have endeavoured to confine myself chiefly to such aspects of our work, as might serve to show its educational value and the principles upon which it is being carried on.

On behalf of the Faculty, I may say in conclusion, that while we rejoice in the success that has come to us, and are deeply grateful for the gifts which have contributed to it in so large a degree, we are at the same time fully conscious of the great and continued responsibility which these gifts and this success impose upon us, and we shall leave no effort untried to prove ourselves worthy of the trust.

The Chancellor briefly addressed the assembly, congratulating the graduating class and prize-winners and thanking all for their attendance.

The pronouncing of the benediction by Rev. Dr. Murray brought the proceedings to a close.

Report on the Medical Faculty of McGill for the Session 1894-95.

The total number of students enregistered in the Medical Faculty during the past Session was 401, of whom there were from :—

Quebec	155	Prince Edward Island	16
Ontario	115	North-West Territories	2
New Brunswick	36	Manitoba	3
Nova Scotia	37	West Indies	4
United States	24	British Columbia	4
Newfoundland	4	Ireland	1

The following gentlemen, 53 in number, have fulfilled all the requirements to entitle them to the degree of M.D., C.M., from the University. In addition to the primary subjects, they have passed a satisfactory examination, both written and oral, on the following subjects: Principles and Practice of Surgery, Theory and Practice of Medicine, Obstetrics and Diseases of Women and Children, Pharmacology and Therapeutics, Medical Jurisprudence, Practical and General Pathology and Hygiene,—and also Clinical Examinations in Medicine. Surgery, Obstetrics, Gynæcology and Ophthalmology, conducted at the bedside of the hospitals:—

Alexander, C. C.	Fredericton, N.B.
Allen, J. H., B.A.	West Osgoode, Ont.
Anderson, D. P., B.A.	New Liverpool, Que.
Anthony, X. L.	Berwick, N.S.
Bailey, J. W., B.A.	Northfield, Minn.
Basken, J. T.	Dunrobin, Ont.
Beatty, E. D	Nepean, Que.
Bishop, C. W.	Montreal.
Blow, T. H.	South Mountain, Ont.
Boucher, R. B	Peterboro, Ont.
Bouck, C. W.	Inkerman, Ont.
Chapman, H. J	Port Elgin, N.B.
Commins, M. E., B.A.	St. Stephen, N.B.
Cowie, W., B.A	Montreal.
Cruikshank, A.	Inverness, Que.
Day, J. L., B.A.	Montreal.
Ellis, W. L.	St. John, N.B.
Feader, W. A.	Iroquois, Ont.
Flinn, J. W.	Montreal.
Fox, C. H.	Oxley, Ont.
Gallant, St., C. J.	Charlottetown, P.E.I.
Gleason, J. H.	Cowansville, Que.
Grant, J. P.	New Glasgow, N.S.
Gun, A.	Durham, Ont.
Hamilton, R.	Bright, Ont.
Hargrave, I. L., B.A	Rosedale, Man.
Harwood, R. deL.	Vaudreuil, Que.
Hogg, L., B.A.	London, Ont.
Hogle, J. H.	Montreal.
Kerry, R. A.	Montreal.
King, J. H	Chipman, N.B.
Knapp, H. T., B.A.	Sackville, N.B.
Lauterman, M.	Montreal.
MacLeay, A. A., B.A.	Danville, Que.
May, G. F.	Montreal.

Merrick, J. H.	Merrickville, Ont.
McKinnon, N.	Park Hill, Ont.
McNally, G. J.	Upper Kingsclear, N.B.
Neill, R. W.	Aylmer, Ont.
Oliver, W., B.A.	Rockburn, Ont.
Price, B. S.	King's Co., N.B.
Quay, D. D.	Port Hope, Ont.
Reilly, W. G.	Ottawa, Ont.
Robertson, J. E.	Morrisburg, Ont.
Saunders, E. H.	Woodstock, Ont.
Shaw, H. M.	Berwick, N.S.
Vipond, C. W.	Montreal.
Walker, D. F.	Huntingdon, Que.
Watson, J. H., B.A.	Barbadoes, W.I.
Wickham, W. W.	Summerside, P.E.I.
Williams, J. A.	Carleton Place, Ont.
Wood, D. M.	Kenmore, Ont.
Wright, H. K.	Montreal.

The following gentlemen, 76 in number, have completed their PRIMARY EXAMINATIONS, which comprise the following subjects: Anatomy, Practical Anatomy, Chemistry, Practical Chemistry, Physiology, Practical Physiology, Histology and Botany :—

Argue, J. F.	Carp, Ont.
Bonnell, S.	N. Sydney, N.S.
Burrell, R. H.	Yarmouth, N.S.
Church, C. H.	Montreal.
Curran, T. J. J.	Montreal.
Crockett, A. D.	Fredericton, N.B.
Donahoe, M.	Cardigan Bridge, P.E.I.
Drum, L., B.A.	Quebec, Que.
Dyer, A.	Montreal.
Edwards, A. F.	Thurso, Que.
Fraser, A. D.	Hawkesbury, Ont.
Foster, A. L.	Ottawa, Ont.
Foster, G. M.	Pembroke, Ont.
Gourley, T. A.	Eganville, Ont.
Gurd, C. C.	Montreal.
Harding, E. S., B.A.	Amherst, N.S.
Harvey, T. C.	Wolfville, N.B.
Harwood, R. DeL.	Vaudreuil, Que.
Healey, D. J.	Sault Ste. Marie, Ont.
Holmes, H. S.	Rat Portage, Ont.
Hughson, R. E.	Blenheim, Ont.
Hume, W. H.	Leeds Village, Que.
Hurdman, H. H.	Ottawa, Ont.
Johnston, Wm.	Charlottetown, P.E.I.
Jost, A. C., B.A.	Guysboro, N.S.

Keenan, C. B.	Ottawa, Ont.
Kemp, H. G.	Brighton, Ont.
Kerr, A. R.	Montreal.
Kirby, H. S.	Ottawa, Ont.
Laidley, J. H.	Montreal.
Lennon, H., B.A.	Montreal.
Le Touzel, J. R.	Goderich, Ont.
Lloyd, C. D.	Lockeport, N.S.
Macauley, J. J. F.	River Dennis, N.S.
MacLeod, E. E.	Vancouver, B.C.
McAllister, D. D.	Belle Isle, N.B.
McCallum, E. C. D.	Maxville, Ont.
McDonald, H. K.	Pictou, N.S.
McDougall, J. G.	New Glasgow, N.S.
McLennan, A. A.	Lancaster, Ont.
McLennon, D. A.	Fournier, Ont.
MacPherson, D.	Montreal.
McRae, J. D.	Glennevis, Ont.
Mallock, N.	Moose Jaw, Ass.
Maloney, M.	Pembroke, Ont.
Mason, R.	Dalesville, Que.
Merkley, E. A.	Morrisburgh, Ont.
Midgley, R. J.	Woodstock, Ont.
Milburn, J. A.	Peterboro, Ont.
Morris, C. H.	Windsor, N.S.
Morse, L. H.	Bridgetown, N.S.
Patrick, D.	Montreal.
Pennoyer, A. R.	Cookshire, Que.
Prescott, A. H.	Queensbury, N.B.
Robert, G. E.	Holyoke, Mass.
Robertson, A. T.	Agassiz, B.C.
Robertson, D. M.	Perth, Ont.
Robertson, F. M.	Chatham, Ont.
Rogers, F. E.	Brighton, Ont.
Roy, J. J.	New Glasgow, N.S.
Ryan, E. J.	St. Kitts, W.I.
Scott, W. T.	Montreal.
Seaton, J. S.	St. John, N.B.
Skeels, A. A.	Montreal.
Smith, H.	Acadia Mines, N.S.
Smith, R. A.	Durham, Ont.
Stackhouse, O. C. S.	Lachute, Que.
Stanfield, H. M.	Truro, N.S.
Sutherland, G. R.	Hudson, N.S.
Thomas, J. E.	Montreal.
Thompson. J. A.	Kinnear's Mills, Que.
Tierney, J. A.	Fallowfield, Ont.
Trainor, J. B.	Kelly's Cross, P.E.I.
Wainwright, F. R.	Montreal.
Wainwright, S. F. A.	Montreal.
Williams, E. J.	Montreal.

MEDALS AND PRIZES.

THE HOLMES MEDAL is awarded to WILLIAM ARNOLD FEADER, Iroquois, Ont.

THE FINAL PRIZE is awarded to WILLIAM GEORGE REILLY, Ottawa, Ont.

THE PRIMARY PRIZE is awarded to CAMPBELL BROWN KEENAN, Ottawa, Ont.

THE SUTHERLAND MEDAL is awarded to CAMPBELL BROWN KEENAN, Ottawa, Ont.

THE CLEMESHA PRIZE is awarded to WILLIAM WALTER WICKHAM, Summerside, P. E. I.

THE CLINICAL CHEMISTRY PRIZE is awarded to W. OLIVER, B. A.

THE SENIOR ANATOMY PRIZE is awarded to E. M. VON EBERTS, of Winnipeg, Man.

HONORS.

FINAL YEAR SUBJECTS.

The following gentlemen have obtained First Class Honors in the FINAL SUBJECTS:

1. Feader, W. A.
2. Rielly, W. G.
3. Anthony, X. L.
4. Wickham, W. W.
5. Bouck, C. W.
6. Wright, H. K.
7. Oliver, W., B.A.
8. Cruikshank, A.

PRIMARY SUBJECTS

The following gentlemen have obtained First Class Honors in the PRIMARY SUBJECTS:

1. Keenan, C. B.
2. McDougall, J. G.
3. Pennoyer, A. R.
4. Smith, H.
5. Stanfield, H. M.
6. McCallum, E. C. D.

Medical Items.

THE DEPARMENTTAL PRISON COMMITTEE ON INEBRIATES.—The report of the Departmental Committee on Prisons, just issued, strongly recommends therapeutic instead of penal treatment for habitually drunken criminals. The committee recognizes that habitual drunkards are not criminals in the ordinary sense, and should stand by themselves in a special category, the physical craving for drink being a disease which requires medical treatment not provided by the present prison system. The committee suggests that persons committed for drunkenness and associated offences should be collected in separate prisons or wards, dealt with as patients rather than criminals, and special medical treatment applied to them. The committee endorses the recommendation of the English committee on inebriates that magistrates be invested with full power to commit habitually drunken offenders for lengthened periods.